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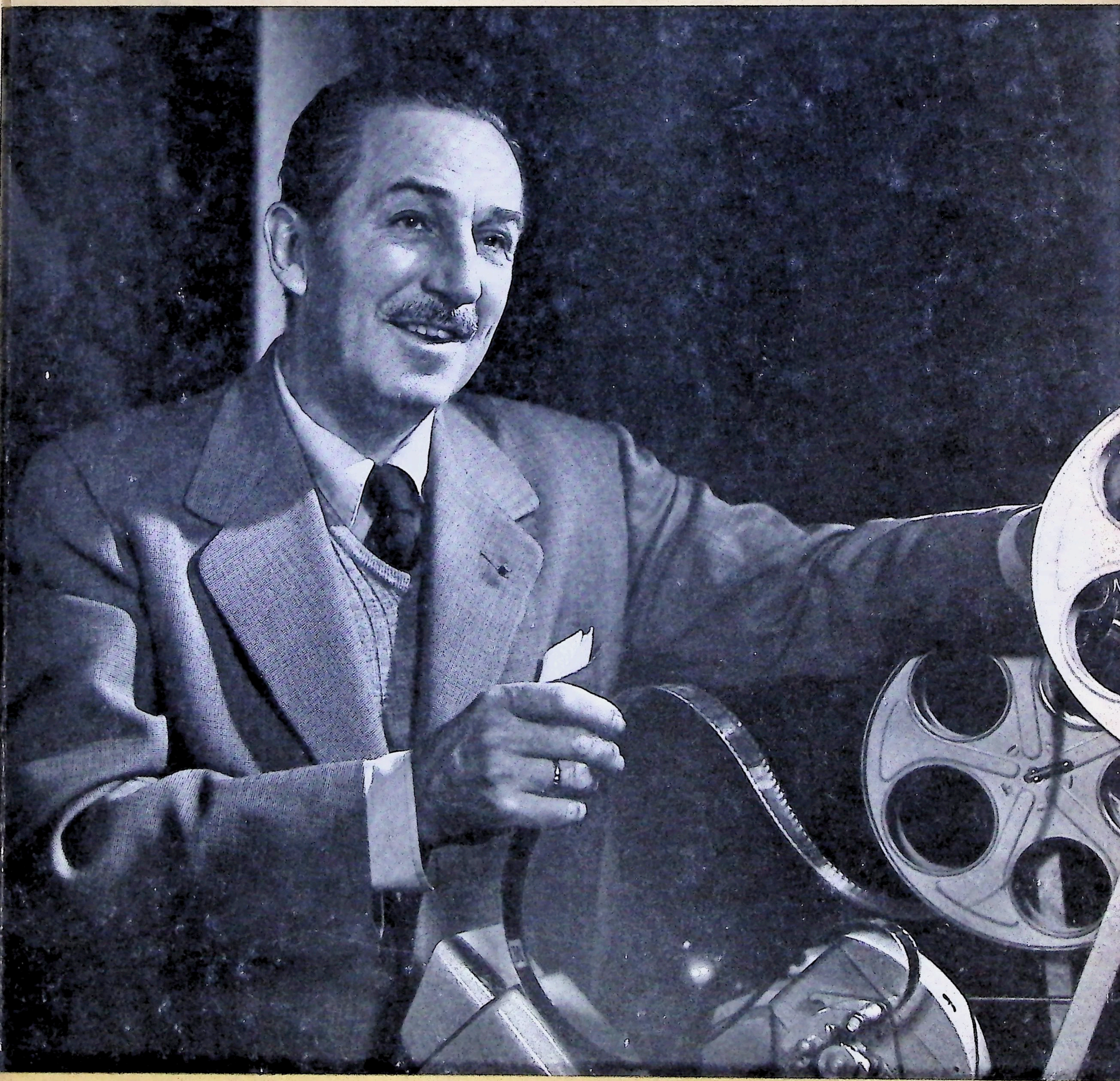
THE MAGAZINE OF KNOWLEDGE FOR LIFETIME LEARNING AND EDUCATION



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LIMITED EDITION

WISDOM OF THE BOOK OF KNOWLEDGE

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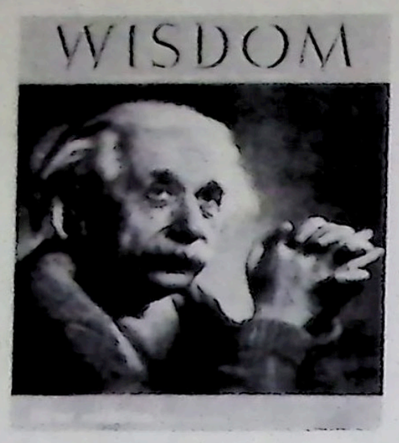

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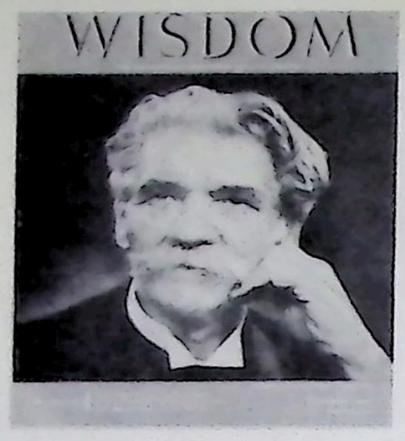

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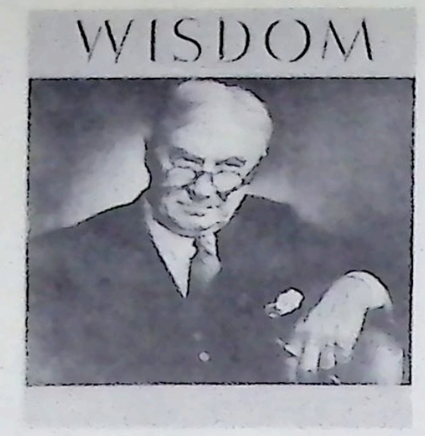

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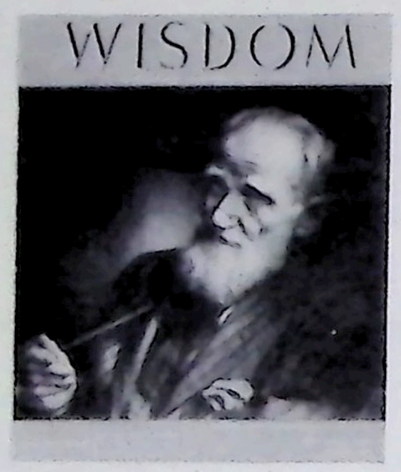

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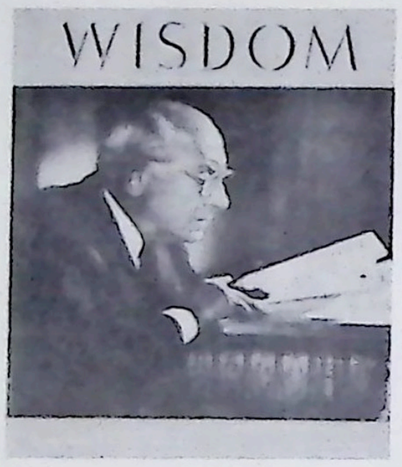

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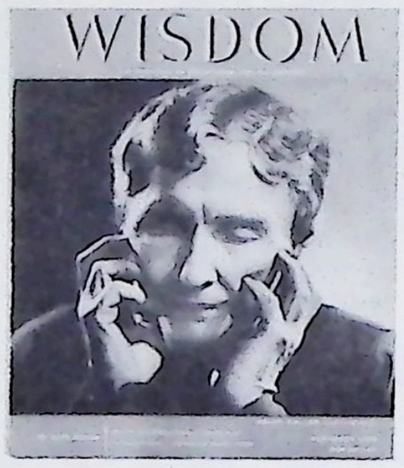

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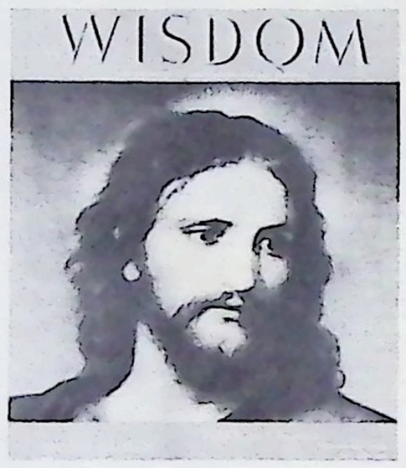

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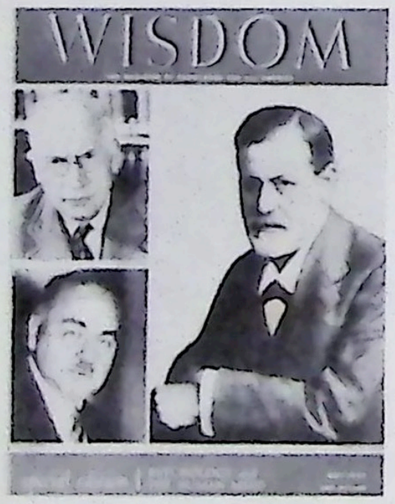

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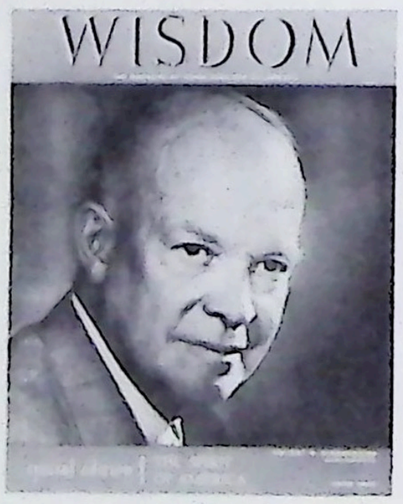

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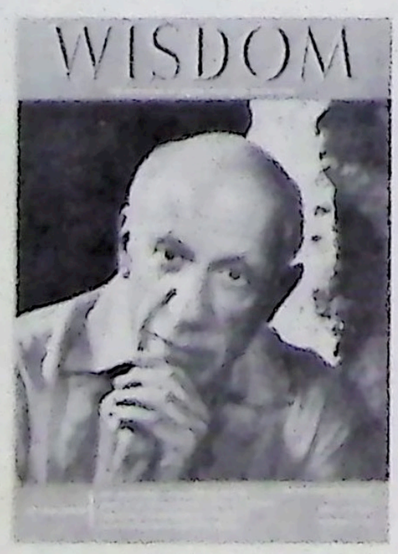

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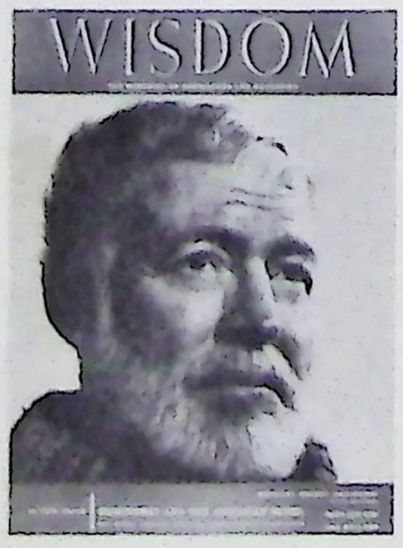

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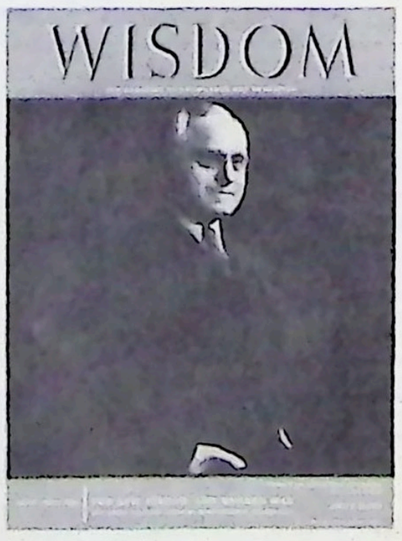

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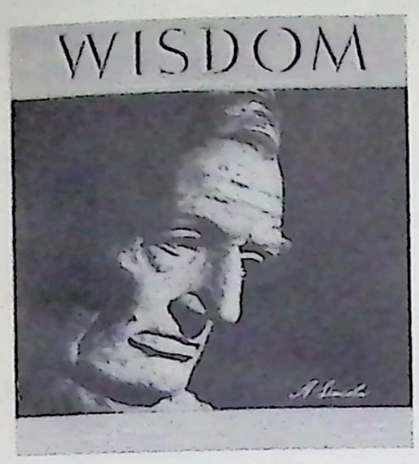

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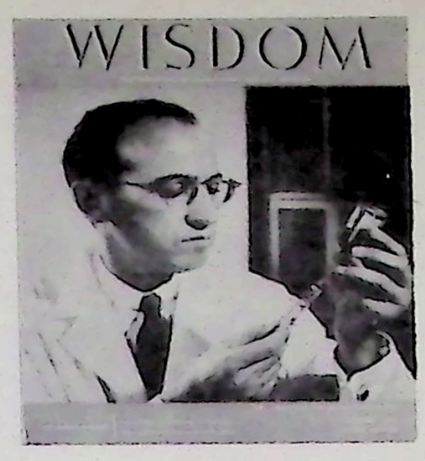

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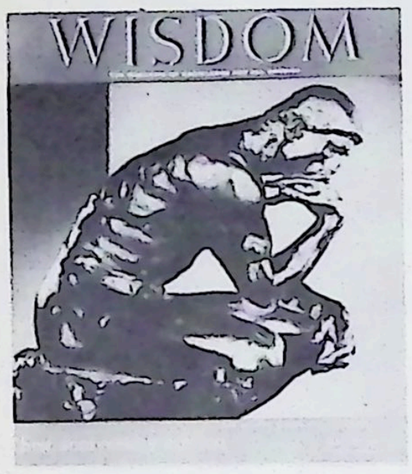

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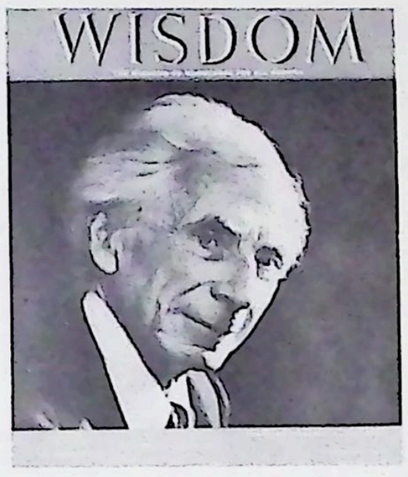

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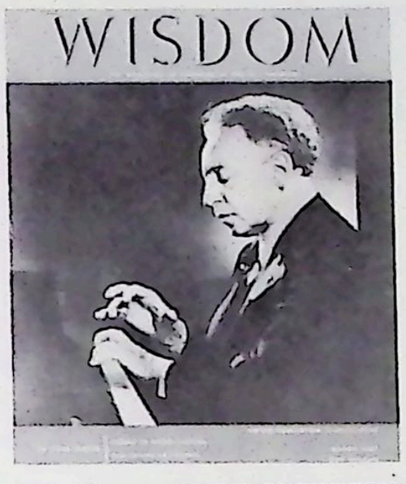

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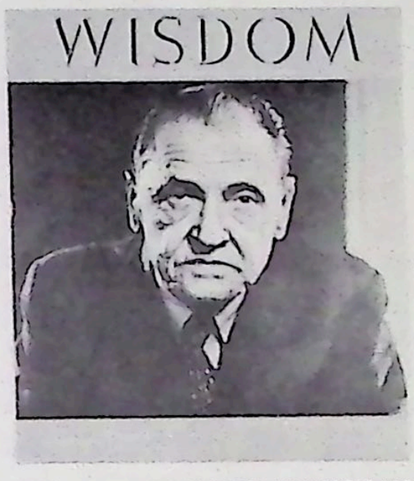

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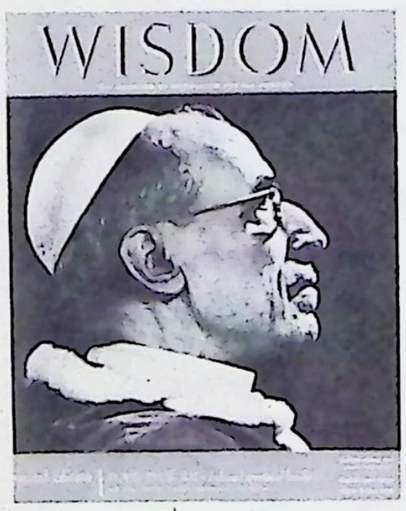

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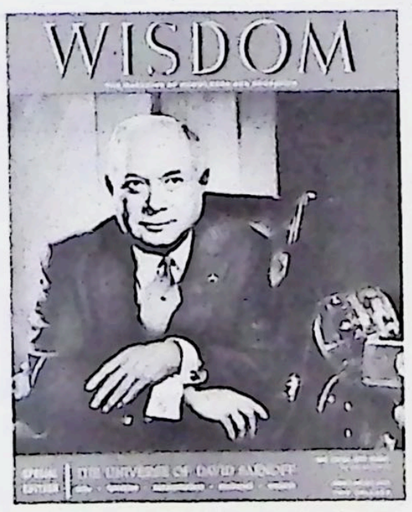

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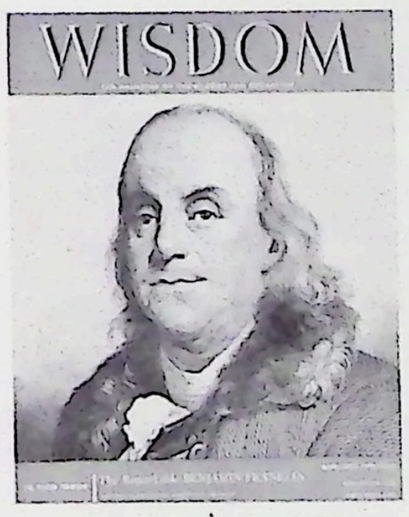

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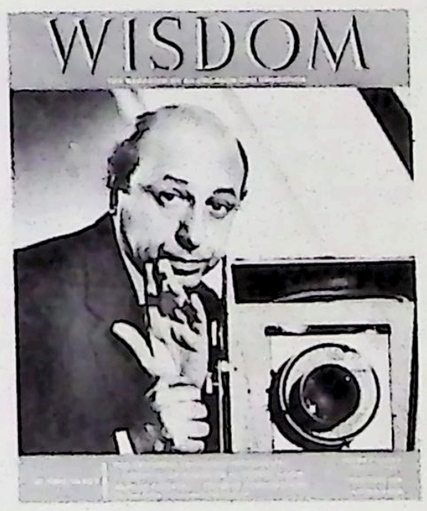

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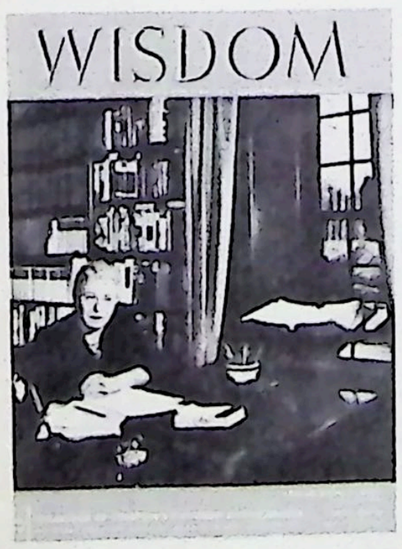

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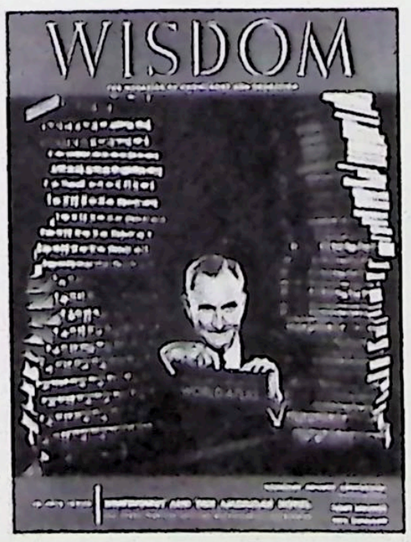

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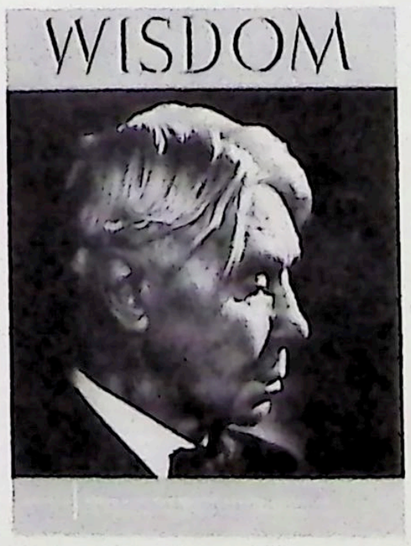

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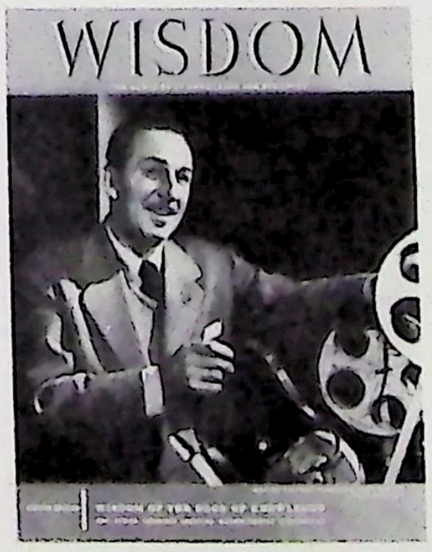

VOL. 32 WALT DISNEY

See inside back cover for index to contents of above volumes.

WISDOM

THE MAGAZINE OF KNOWLEDGE FOR LIFETIME LEARNING AND EDUCATION

LEON GUTTERMAN
Editor and Publisher

IN THIS VOLUME OF WISDOM:

WALT DISNEY: A BIOGRAPHY	46
ANIMATED CARTOON WORLD OF WALT DISNEY	50
ANIMATED FEATURE LENGTH WORLD OF WALT DISNEY	56
THE ART OF ANIMATION	64
LIVE-ACTION MOVIE WORLD OF WALT DISNEY	66
DISNEYLAND	72
WISDOM OF WALT DISNEY	76
THE STORY OF THE BOOK OF KNOWLEDGE	2

The following articles, condensed from The Book of Knowledge, were written by the world's greatest educators, scholars, and eminent authorities in every field of human knowledge.

BIOGRAPHY

KING ARTHUR	12

EDUCATION

YOUR CHILD'S I.Q.	6
WONDER QUESTIONS	44
HOW MAN LEARNED TO WRITE	14

HISTORY

RACES OF MANKIND	16

LITERATURE

WHAT IS A CLASSIC?	26

NATURE

NATURE'S ANIMAL KINGDOM	32
THE PRAIRIE DOG	42

SCIENCE

CHEMISTRY IN TODAY'S WORLD	28
MAN AND HIS UNIVERSE	10
THE BRAIN	31

SOCIOLOGY

GOOD CITIZEN IN A FREE SOCIETY	5

BETTY-JANE LANG, *Editorial Director*

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VOLUME 32

December 1959

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A LETTER FROM THE PUBLISHER

LEON GUTTERMAN, EDITOR AND PUBLISHER

SEVERAL PHILOSOPHERS were engaged in a discussion of the value of education. One man stressed the importance of a good education, saying that anyone is at a distinct disadvantage without it. "Well, now, I'm not so sure about that," replied an old man who had overheard the conversation. "I'm not educated at all, and it seems to me that when you're not educated, you just have to use your brains!"

The great business of man is to improve his mind. Parents and schools must encourage brains, for our world needs brains desperately. The more you use your brain, the more brain you will have to use. No brain is stronger than its weakest think. Seneca said, "As the soil, however rich it may be, cannot be productive without culture, so the mind without cultivation can never produce good fruit." A good mind possesses a great fortune. A fresh mind keeps the body fresh. The human mind cannot create anything. It produces nothing until after having been fertilized by experience, learning, and knowledge; its acquisitions are the seeds of its production.

The mind of a man is like a clock that is always running down, and requires constant winding. The mind is like the stomach. It is not how much you put into it that counts, but how much it digests. Minds are like parachutes: they function only when they are open. "Old minds," said John Adams, "are like horses; you must exercise them if you wish to keep them in working order." The failure of the mind in old age is often less the result of natural decay, than of disuse. Ambition has ceased to operate; contentment brings indolence, and indolence decay of mental power. Men have been known to die, literally speaking, of disease induced by intellectual vacancy. Mind unemployed is mind unenjoyed.

"To live is to think," said Cicero. Thinking is only a process of talking to oneself intelligently. Thinking is a lonely job. Yet, they are never alone who are accompanied by noble thoughts. "Thinking lengthens life," says a famous physician. Thinkers are happier, more alive, more adventuresome, more productive. Thought means life, since those who do not think do not live in any real sense. Thinking leads man to knowledge. Take away thought from man's life and what remains?

Montaigne wrote: "The pleasantest things in the world are pleasant thoughts; and the great art of life is to have as many of them as possible." Many people don't believe in new thoughts. They just use the old ones over and over again. The happiness of your life depends upon the quality of your thoughts. Thoughts rule the world. The greatest events of an age are its best thoughts. Thoughts are the most powerful things. Nations, cities, buildings, follow the thoughts of men. Men think—and out of the unknown come things. Good thoughts are blessed guests, and should be heartily welcomed and much sought after.

The purpose of education is to lead us to great thoughts, prepare us to live, to think, to be happy, and to qualify us for leading the best, the fullest and most useful life possible. Aristotle said, "Education is an ornament in prosperity and a refuge in adversity. The roots of education are bitter, but the fruit is sweet." Education means developing the mind, widening its horizon, inflaming the intellect, not stuffing the memory with an accumulation of information. Stuffing the mind with facts is simply intellectual taxidermy and is worthless. True education converts the mind into a living fountain, not a reservoir. It is a continuous process ending only when ambition comes to a halt. Education awakens the natural curiosity, broadens the narrow mind, teaches one to think clearly. Education means drawing forth from the mind latent powers and developing them.

Every person has two educations—one which he receives from others, and one more important, which he gives himself. The better part of every man's education is that which he gives himself. The only really educated men and women are self-educated. The man of intelligence understands the value of knowledge and provides himself with it, for knowledge is the only instrument of production that is not subject to diminishing returns. Knowledge raises one man above another. Benjamin Franklin said, "An investment in knowledge allways pays the best interest." First-hand knowledge does not become second-hand when used. Knowledge does not exist in and for itself. It is only an instrument, a tool, which may be used for good or evil. The aim of education is to use it as a tool for good.

Said Montaigne, "It is good to rub and polish our brain against that of others." Education is to know the best that has been said and thought in the world. A liberal education is that education that teaches men to understand each other, to understand the life around them, and how to live with each other. Education can't make us all leaders but it can teach us which leaders to follow.

It's easy to attend college, but nothing is harder than to get educated. It is a pity that so many men and women get a college training without getting an education. You can lead a boy to college but you can't make him think. If college students talked only about what they understand, the silence would become unbearable. Happy college freshmen! Only four years more and their education will begin. An A.B. degree from a college today simply means that the graduate knows the first two letters of the alphabet. However, a college education seldom hurts a man if he is willing to learn a little something after he graduates. A university president recently told me that in his opinion a college graduate is one who is presented with a sheepskin to cover his intellectual nakedness. As I see it, it wouldn't hurt any if the colleges would work their way through some of the students. Most times the only thing a man gets out of college is himself.

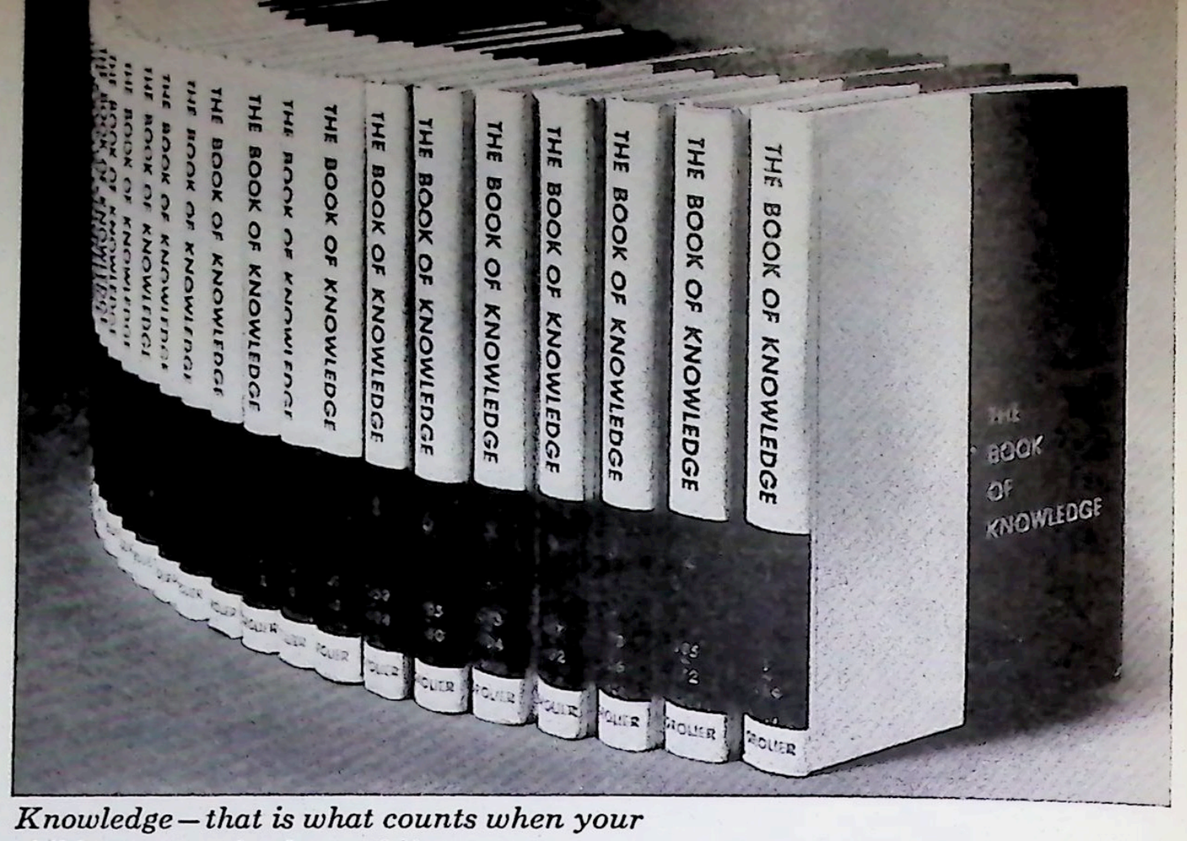
Life is but one continual course of instruction. Learning is not wisdom. Learning is food for the mind. The more we learn the more we discover our ignorance. Therefore, it is wise to get knowledge and learning from every source. Learning is like rowing upstream; not to advance is to drop back. Learning makes a person fit company for himself. Learning is useful only when we know how to make the right use of it. Learning is wealth to the poor, and honor to the rich, an aid to the young and a comfort to the aged.

No man is educated or wise who has not learned enough about some subject to know how little he knows. Plato said, "The learning and knowledge that we have is, at the most, but little compared with that of which we are ignorant. Better be unborn than untaught, for ignorance is the root of misfortune." The doorstep to the temple of wisdom is a knowledge of our own ignorance. Knowledge may have its limits, but ignorance has no such restrictions. What we know here is very little, but what we are ignorant of is immense. The more we learn the more we discover our ignorance. The difference between most of us is that we are ignorant on different subjects. Disraeli said, "To be conscious that you are ignorant is a great step to knowledge." Shakespeare said, "Ignorance is the curse of God." Ignorance is voluntary misfortune. It is prolonged infancy. It is as great a point of wisdom to hide ignorance, as to discover knowledge. The only thing more expensive than education is ignorance.

A man's wisdom is his best friend; ignorance his worst enemy. If a man's eye is on wisdom, his intellect will grow. As Bacon put it, "God has placed no limits to the exercise of the intellect he has given us." We must guard against being satisfied with what we are and what we have done. We are so small and life is so big. We must grow in wisdom, for in seeking wisdom we are wise. The more a man knows the more worthy he is. The man of wisdom has founded his house upon a solid rock. You can never take away the magnificent mansion of his mind.

Leon Gutterman

The WISDOM SEAL OF APPROVAL *has been awarded to* THE BOOK OF KNOWLEDGE *as a tribute to 50 years of publishing.*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Knowledge—that is what counts when your children go out in the world!—CARL SANDBURG

THE STORY OF THE BOOK OF KNOWLEDGE

Walt Disney is one of the noblest influences in the world today. Respected and admired for his continuous and significant contributions in combining successfully the fields of entertainment and education for American youth, he has consistently encouraged the love of learning and knowledge through his many superb productions. Disney, who wrote the introduction to The Book of Knowledge, is shown discussing an article in one of the volumes with two gifted children who appear in his films.

The Book of Knowledge is enjoyed by children and appreciated by adults the world over. The first great authoritative children's encyclopedia and reference work of knowledge created to teach, mold, prepare growing young minds for a full life, The Book of Knowledge celebrates its fiftieth anniversary with its most magnificent edition.

by the Editors of Wisdom

Truth never grows old, beauty of mind and spirit is ageless; so though the years pile upon it, the dust of disuse will never dim its usefulness. Wise men, fine teachers, devoted leaders of youth keep renewing the facts that are the body of The Book of Knowledge so it is always Today within its pages, while Tomorrow looks over the edges. Children of Yesterday still turn its pages and Today's children turn to them as a never-failing source of knowledge, an ever-ready friend that takes the knots out of school problems and makes the scholars' way easy. You can help your child to help himself, secure in the knowledge that school and home are at last linked and working harmoniously. With a gesture as easy as turning the pages of a book you have doubled your child's opportunities and multiplied his powers.—ANGELO PATRI

THE BOOK OF KNOWLEDGE has been a children's favorite and the first choice of parents for fifty years. What causes it to be so popular and useful that it is found in millions of homes and thousands of schools and libraries all over the world? Why does it share the importance of many inventions and discoveries which have come into our lives since the early 1900's?

Our Twentieth Century was but a few years old when its discoveries and inventions opened a whole new world before our eyes. Two men invented an airplane that could actually fly. Out of the dot-and-dash wireless the radio was born. Medical science amazed us with the prevention and cure of hitherto mysterious diseases. Educational leaders made history by demonstrating that they could improve a child's "mental" health. With dramatic suddenness these discoveries in only one decade brought us more progress and pleasure than was known in whole centuries past. Among the discoveries of the "miracle" age came the idea which led to the publishing of *The Book of Knowledge*. This idea brought with it undreamed-of advancement in home education. Without it, the teaching and training of children in the home might have remained little more than the formal routine of the preceding century.

In the early 1900's the small daughter of Arthur Mee, a young newspaper man, delighted him—and often stumped him—with her many curious, puzzling questions: "Why do I dream, Daddy? What makes the colors of the sunset? Why can the cat see in the dark? How does a cow make its milk? What holds up the sky? Why can't we see stars in the daytime?" Questions such as these left him groping for correct, satisfactory answers, and, as he listened, he became suddenly aware that millions of other children were seeking answers to the questions that puzzled their young minds. He realized that the answers he knew or was able to find were not the answers a child would understand, and that not he alone, but parents everywhere, needed something their children could turn to in their thirst for knowledge—books that would answer curious, puzzling questions in words and pictures that a child could not only understand, but enjoy and remember.

Arthur Mee went to his publisher and outlined the publication of an unusual work to answer the most common questions asked by children —a set of books that could be expanded until it would cover most of the world's knowledge. It was to be simply written, illustrated with color, dramatized so that children would read it as they would a story, and lavishly illustrated with pictures to hold attention and visualize for the child the knowledge it contained. His publisher thought so well of the idea that a staff of writers and artists was put to work immediately on this new and original children's literature, which was published in 1908 as *The Children's Encyclopedia.*

The Grolier Society, a leading New York City publishing house specializing in the sale of artistic editions of the classics, saw educational possibilities in this unusual work far beyond the original Arthur Mee idea, and, after acquiring the publishing rights, invited Holland Thompson, Ph.D., Professor of History of the College of the City of New York, to become its editor.

The first edition published under Professor Thompson's editorship appeared at Christmas-time in 1911 bearing the title, *The Book of Knowledge*. The set, originally announced in a modest advertisement in the Sunday edition of *The New York Times*, challenged the reader with such headline questions as: Why does salt melt snow? Where does the day begin? and others which express a child's simple curiosity—and the public was offered a booklet of sample pages. An avalanche of requests for the booklet descended upon the Grolier offices and newspapers, magazines, educators, members of the clergy, psychologists, literary critics, and prominent laymen were soon telling their readers and friends about the wonders of the set. "Let's look it up in *The Book of Knowledge,*" was soon to become a byword in the homes of thousands of children. Within three years the set became an institution throughout the English-speaking world—there was a special Canadian edition, and translations were soon made into French, Italian, Portuguese, Spanish, and finally into Chinese.

The first 10,000 sets of *The Book of Knowledge*, the first multi-volume children's encyclopedia ever published, were deemed sufficient to last for two years but were sold in six months. During the last fifty years more volumes have been sold in the United States than any other book except the Bible.

The basic purpose of the set has always been to provide both a reference work for fact-finding and to encourage further reading. This dual purpose is accomplished with the inclusion of comprehensive factual details, complete background data and related information on all subjects covered in the work, which naturally stimulates the young person to further reading with the reference source in his hands and by this sequence leads him to additional reading in a collection of library books. Today's set—a reference encyclopedia distinctively designed for children; arranged topically; built to promote further exploration and informal reading; a pleasure to look at; fun to read; modern in design, both inside and out; and world-wide in scope, is still the greatest achievement in the history of children's reference works. *The Book of Knowledge* is easy to read because the editors planned it that way. It takes the work out of homework and puts fun into fact-finding.

The Book of Knowledge is divided into eighteen departments: The Earth, Science, Animal Life, Plant Life, Our Own Life, Familiar Things, Literature, Stories, Famous Books, All Countries, The United States, Canada, Wonder Questions, Men and Women, Golden Deeds, Poetry, The Fine Arts, Things to Make and Things to Do.

Within each department, the story of knowledge is told, step by step, in proper reading order. Take, for example, *The Earth*. The account begins where the child begins; the first pages deal with the earth under his feet. Successive articles spaced logically through the several volumes deal with the air about the earth, then the moon and sun and stars, and finally the vast universe—with stops along the way to examine the work of the astronomer and to visit an observatory and a planetarium. Another sequence from the same beginning examines the earth itself more closely, its crust and interior and the history of the earth that can be read in

the rocks. Thus the way is prepared to lead off in many new directions, to plants and animals on the earth, even to the early history of man. If the child's fancy is caught by the sea around him or the clouds over his head, he can follow another broad road of knowledge.

Boys and girls are not solemn little scholars, prepared to survey all of knowledge. Their attention lags, they turn to a new interest, the spirit of fun wells up. Thus *The Book of Knowledge* does not try to impart all of history or science or art in a single article or at a single sitting. The story of a broad topic is broken off, the various parts spread systematically through the several volumes, to be taken up again when interest revives. Another topic is introduced, the child's fancy caught afresh, and off he goes into another part of the world of fact and imagination.

Perhaps its greatest attractions to children, aside from its thousands of colorful pictures, are the almost 600 fascinating and provocative *Wonder Questions*, irresistible because they answer perplexing problems confronting us in our daily living. In its well-rounded presentation of the world's knowledge, the set also devotes considerable space to stories, poetry, nursery rhymes and the fine arts. The poetry collection contains hundreds of favorites old and new—a treasury of verse that adds its own beauty to every home. Indexed four ways, by author, title, first line of poem and subject, any poem is easily located. The *Fine Arts Department* has its own simplified indexes. For development of handicrafts, young people must be shown how to work with their hands and the *Department of Things to Make and Things to Do* answers the need to build, to create, to carry out ideas—hobbies and crafts to keep a child pleasantly occupied for thousands of hours. This is not the order of a dictionary of facts nor of a textbook, but it is the order of the child learning and enjoying himself as he learns—an order marked by variety, by a mingling of education and recreation, by a constant broadening and deepening of understanding.

Although all departments are represented in every volume, it is a *children's* encyclopedia—designed, arranged, written and edited in accordance with the needs of children, their interests and the curriculum they study. The editors follow the best standards of modern adult encyclopedias—their accuracy, up-to-dateness, and comprehensiveness—but the final determinant of content, presentation and organization is the needs of children. The publishers believe that the sequence of editorial material is the one most likely to build the reading habit and to satisfy a young reader's demand for change in interest. The arrangement is shown simply and clearly in the *Table of Contents* of each volume, where chapters are grouped under department heads. The purposes of the editors and the interests of the children would not be served by breaking down the units or chapters into fragments and scattering them in accordance with the alphabet.

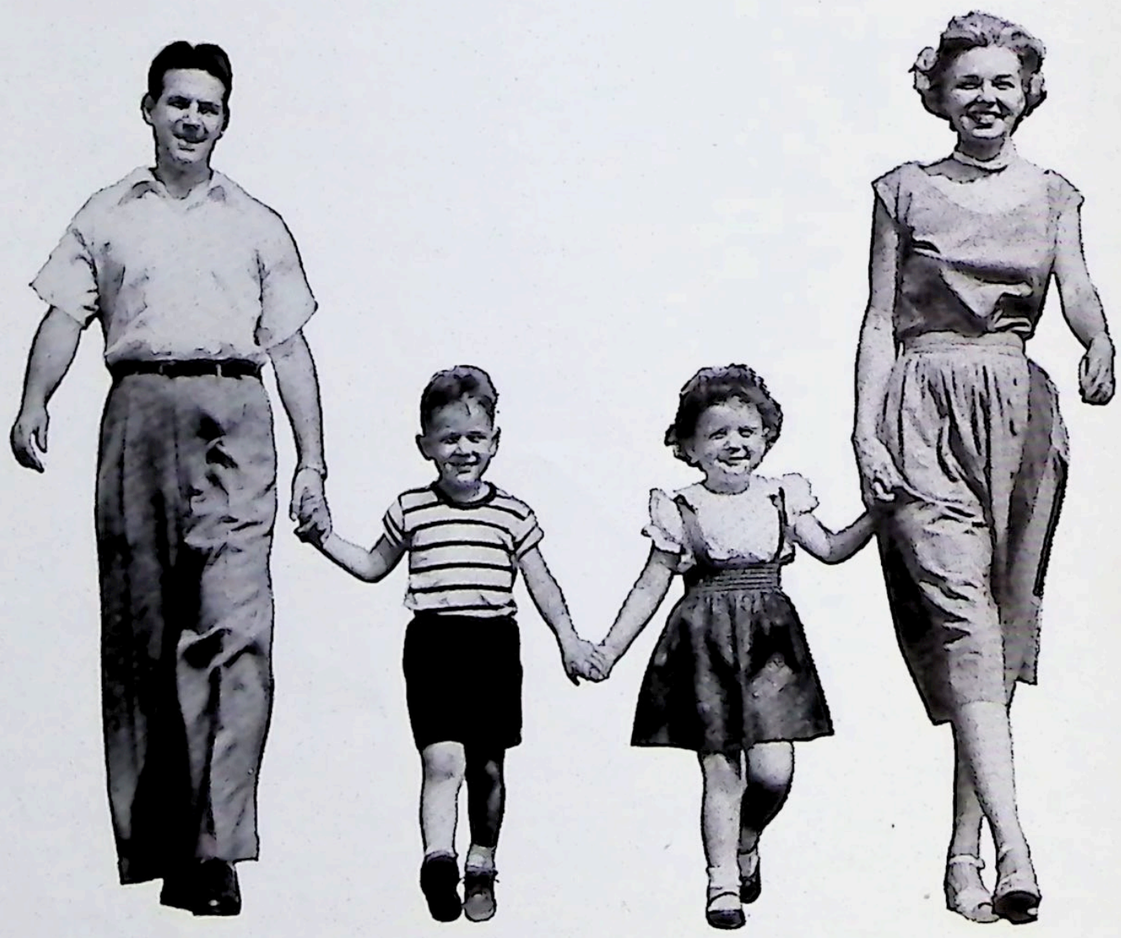
Information is mobilized in the complete and remarkable *Index* in Volume 20, with its 50,000 entries. If the child seeks a very specific piece of information, the *Index* itself may give it to him instantly, by means of its clear fact entries, in which case he need not even turn to another part of the set. If he seeks other information, the *Index* identifies for him the full resources of *The Book of Knowledge*, listing not only main topics covered, but minor ones as well. By means of starring some entries, it readily identifies the more important articles on a subject, and it indexes illustrations and refers to related topics. The *General Index* guides a child to broad units and to specific facts; by the *Tables of Content* in the various volumes he can follow a major subject; and by reading along at will he can go on voyages of discovery richly rewarding and meaningful. Through this unique arrangement every volume is an invitation to share in the wonders of the written word. The set is *The Book of Knowledge*; its *Index* is the key to knowledge.

The publishers maintain a permanent staff of expert writers and editors, supplemented by leading authorities from every part of the globe, who revise approximately 1,000 of the more than 8,000 pages of the set each year. These eminent authors, diplomats, educators, engineers, newspaper and magazine writers, scientists and sports figures are constantly at work recording the story of mankind and explaining the facts behind the latest news around the world. Each year they assemble scores of new and intriguing articles and hundreds of lively, colorful illustrations into a world diary. This is called *The Book of Knowledge Annual*. Containing over 400 pages on World History, Government Activities, Science, Business, Biographies, Transportation and Sports, the *Annual* becomes a permanent part of the set, keeping it current for many years to come.

All young children are human question marks. Their eager minds are searching for facts. A child's questions should not go unanswered, for the child who knows the answers, and in early life gains knowledge, will go further and faster in the race towards leadership and success. One of the greatest parts parents can play in helping their children achieve success is in supplying the proper equipment. *The Book of Knowledge*, for fifty years the choice of hundreds of thousands of parents who wanted the best for their children, is an authoritative reference; an encyclopedia which children understand; a fascinating story teller; a walk through history; a keen observer of world-changing experiments; a returned explorer from all the lands of the world; a hidden camera in jungles, on ice-coated mountains, on the sea, the land and in the air; an adventurous journey over lofty mountains, vast deserts, pounding seas and winding rivers. It is the pages on which great writers have recorded their immortal works; in which distinguished painters and sculptors have designed their masterpieces; a record of man's deeds—good and bad—since the beginning of time. *The Book of Knowledge* is the glory of learning and the pleasure of achievement, a study in biology, botany and biography. It is the mind of a genius through the eyes of a child.

Tomorrow comes quickly, and brings with it a constantly increasing demand for trained, educated minds. The guidance you give your children today is the basic structure of their tomorrows. Your every thought is of their well being—their success in life. Their future will reflect the love, care and guidance you give them. ◆

Education is the most valuable legacy that parents can leave their children.



THE GOOD CITIZEN IN A FREE SOCIETY

from the Wisdom of The Book of Knowledge

WHAT is a free society, and what duties toward it do even children and young people owe in return for its gifts and privileges? A free society surely does not mean that one is free to behave in a careless, thoughtless way. The very word "society" means a collection of many people, young, middle-aged and old, all free to make their own decisions and yet not free to endanger the good of that society by making wrong and unjust ones. A free society has faith in its people, believes in their honesty and in their sense of values, depends upon each to keep it free. It must, for the very sake of its freedom, expect from its members consideration for others, a pride in the common good of all, behavior which is not selfish and careless but generous and thoughtful—all elements of that noble feeling which we call patriotism, the love of our country whether at peace or at war and the determination to prove worthy of our country's trust in us.

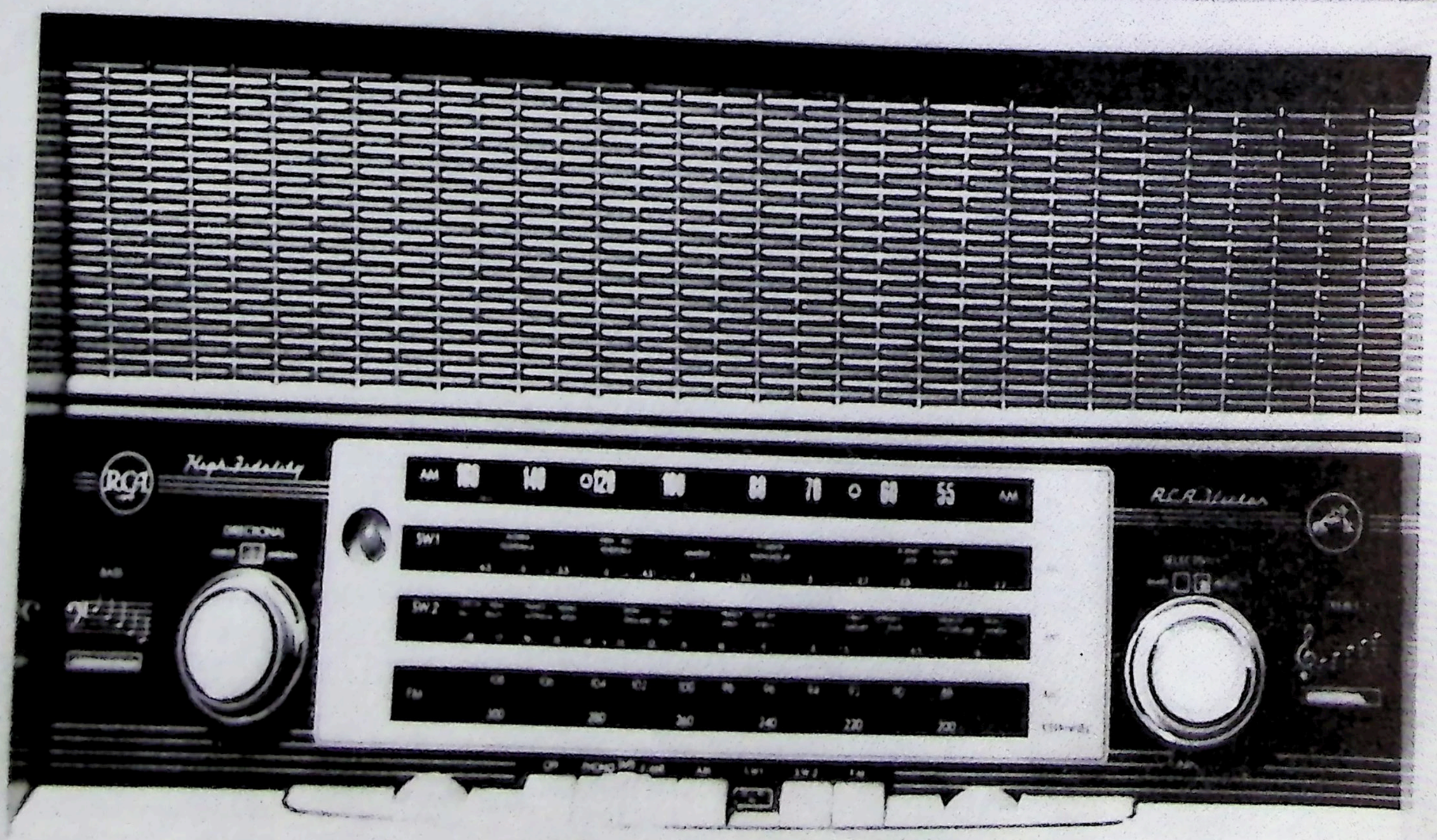
You belong to a free society. You live in a community, perhaps in a sizable town or even a city, perhaps in a small town or a village, perhaps in the country on a farm or ranch. But, wherever you live, the point is that you are one member of a group of people. You may seem unimportant in yourself; but you are of the utmost importance, for the well-being and happiness of your community depends upon you. You cannot nurture hatred and suspicion toward those of another race or color without lowering the standards of your entire community, the portion of that free society of which you are a part. Your community, whatever its size, depends upon you to uphold its standards. In return for the gifts and privileges that it daily and hourly gives to you, can you possibly let it down?

Let us think for a few minutes of certain of these gifts and privileges that you too often take for granted. First of all, you are trusted. No higher, ruthless authority, as in countries which are not free, watches your every act, suspects you, dictates your behavior, even tells you what you must or must not think. You are trusted to act honestly, to behave well, to make up your own mind. The men and women who govern your community are freely chosen by you. The welfare of all communities in a free society is based upon this mutual trust, this assumption that all work toward the common good. And when that trust proves undeserved or misplaced, as it sometimes sadly does, whether in the case of individuals or of groups, a free society takes it away and places it elsewhere.

You are free to make your own decisions; to choose the church that you wish to attend; to decide upon the trade, business or profession for which you seem best suited; to belong to any political party which you find most expressive of your own ideas and ideals. You are free to choose your own friends, to save your money or to spend it foolishly, to read good books or to neglect them, to behave courteously or rudely. The community of which you are a part not only trusts and needs you, but it also provides you with all manner of help, opportunity and encouragement. It does its best to give you good schools, for the most part free ones; it supplies you with facilities for recreation and pleasure.

These are some of the many privileges granted by a free society through its countless cities, towns, villages and country districts. ♦

The entire world belongs to the inquiring mind, the vivid imagination of today's youngsters.



YOUR CHILD'S

I.Q.

from the Wisdom of The Book of Knowledge

THE letters "I.Q." are the initials which stand for the words "Intelligence Quotient." The word "intelligence" is quite common in our daily speech, and although we mix up its meanings, we are fairly certain that a child needs intelligence in order to do the many things asked of him in the grades, high school and college. The word "quotient" is taken from arithmetic, and means a figure that is obtained when you divide one number by another. When we divide 36 by 12 and get 3, the 3 is the quotient.

To find a child's Intelligence Quotient, we first count up the number of years and months of his actual age (called Chronological Age, or Calendar Age). Then we give him a test in which the questions have been carefully arranged. At the beginning even a youngster of three years usually knows the answers; the difficulty of the questions gradually increases so that it takes a child of around ten or twelve years of age to get the right answers, and so on. In other words, an average ten-year-old child should be able to do all the three-, five-, seven-, eight- and ten-year-old questions, but he will have difficulty with the twelve- and fourteen-year questions. Instead of counting up the per cent he makes on the whole examination, we find how far up he can go in this scale in terms of the difficulty of the questions. This test score is then called the child's Mental Age, although it probably should be called his Test Age.

With the child's Chronological Age and Mental Age now known, we can very easily figure out what his Intelligence Quotient (I.Q.) will be. By dividing the child's actual age (Chronological Age) *into* the age score (Mental Age) he made on the test, we get his Intelligence Quotient. If a ten-year-old makes a ten-year score on the test we divide 10 by 10 (or 120 months divided by 120 months) and the quotient is 1.00. The decimal point is ignored, so we say that the child has an I.Q. of 100, which is average. Now if an eight-year-old youngster was able to answer all the eight-year questions on the test and even go so far as to pass the ten-year questions also, he then would be given a test score (Mental Age) of 10, which when divided by his age (8) would give him an Intelligence Quotient of 125 (10 ÷ 8 equals 1.25), and he would be classed as being *above average*, or *superior*. Instead, if for a variety of possible reasons, the eight-year-old was not able to answer the eight-year questions, and could pass only the three-, five-, six- and seven-year questions, then we would divide his Mental Age of 7 by his real age of 8 and his I.Q. would be 87½, recognized as *below* average (7 ÷ 8 equals .875).

It can be seen from the above illustrations that an I.Q. can be obtained for almost any child between the ages of three and sixteen years. With different types of tests and different ways of scoring, even younger and older individuals may be measured. Not only that, the same child can be measured at different ages. If he is average, as a four-year-old he would pass the four-year questions and show an I.Q. of 100 (4 ÷ 4 equals 1.00, or 100); and as a twelve-year-old he could pass the twelve-year questions and still show an I.Q. of 100 (12 ÷ 12 equals 1.00, or 100). These tests are not just a collection of questions made up out of thin air, but have been worked out and tried over and over again with thousands of school children of all ages, so that when a child secures a score on these tests he is actually being compared with children from all walks of life.

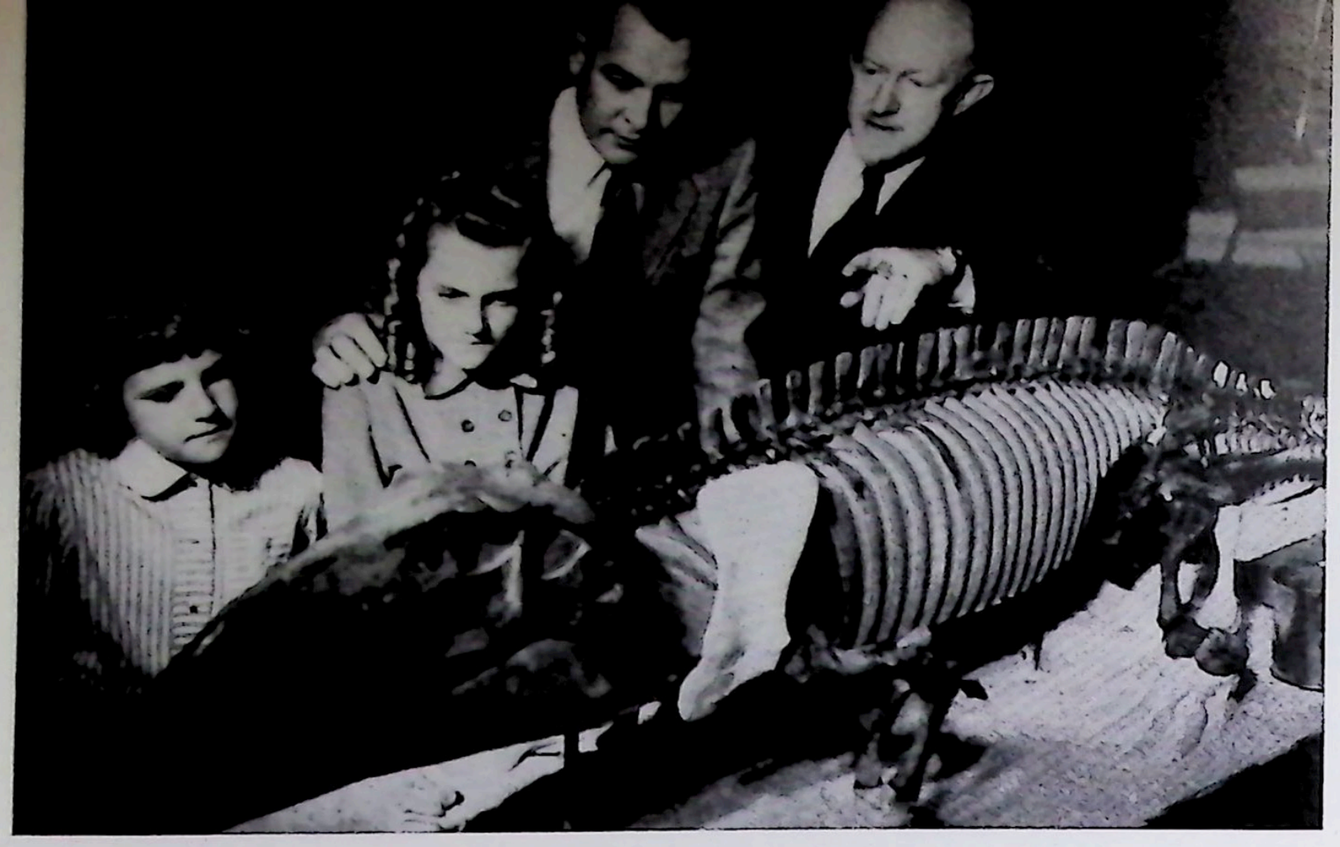
Does the test measure everything? Of course not. For example, it will not show how happy the child is in relation to his home and school. Nor will it tell how well he can hold a job when he grows up. These scores will not directly show whether he will be popular, well liked, shy or boisterous. Each one of us has known individuals who were not the brightest in school, yet who now occupy a real place in the neighborhood, respected by people of their own age, and loved by their families. At the other end of the scale we may have also known the bright child who turned out to be arrogant, or excessively shy and incapable of entering into the plays and games enjoyed by groups of children and adults.

Furthermore, there are many trades and skills which are not touched by this sort of measurement; such trades and skills, in fact, make up more than three-fourths of the world's employment. It must not be believed that a high I.Q. means a poorly adjusted person, any more than we should believe that a high I.Q. shows the individual to be the "best" in his group. We must consider many other factors along with the I.Q. score, and only then will we get the full picture of our children's interests and possibilities.

The I.Q. is concerned most closely with the ability to do work requiring the special study and preparation which are characteristic of advanced schooling. A youngster with an I.Q. distinctly below the average should not be advised or encouraged to set his goal on becoming a doctor. He might well have the social poise needed by a physician, but long before he could practice he would be required to enter college and take courses of the most complicated and technical nature, and pass these well at the head of his class before being recommended to even more complicated school work in the medical college itself. If difficulty in school work is already present, along with an I.Q. below average, how much more sensible it would be for a boy to turn early in life, with careful and skillful guidance, to other fields of work where advanced schooling is not so strongly required.

Is this I.Q. a trait that is inherited from one generation to another? Today the answer is probably: "Within limits—no." In the early history of mental measurements the inheritance of the I.Q. was undoubtedly exaggerated. Much evidence has been gathered which shows that the encouragement of parents, teachers, friends, successes and failures in school, work habits and study habits, and whether or not there has been built up a well-directed enthusiasm for this type of ability early in the child's life . . . all exert their influence on the measured I.Q.

Well-chosen reading material in the home adds substance to that which we are measuring. So does encouragement given to the child in such a way that he learns to find in guided reading not only the answers to questions but also the happiness of discovery and imagination undoubtedly essential for intelligence. Some reports show that the I.Q. can be changed to quite a considerable degree when surroundings are changed. However, most of our surroundings do not alter very much



A child's I.Q. often depends on the way his education is directed.
Interest captured today makes the educated individual tomorrow.

Minds of youngsters playing chess, traditionally considered an adult game, are stimulated by the challenge of its intricate problems.

Well-selected reading material in the home broadens the interest of the child and opens the doorway to learning.

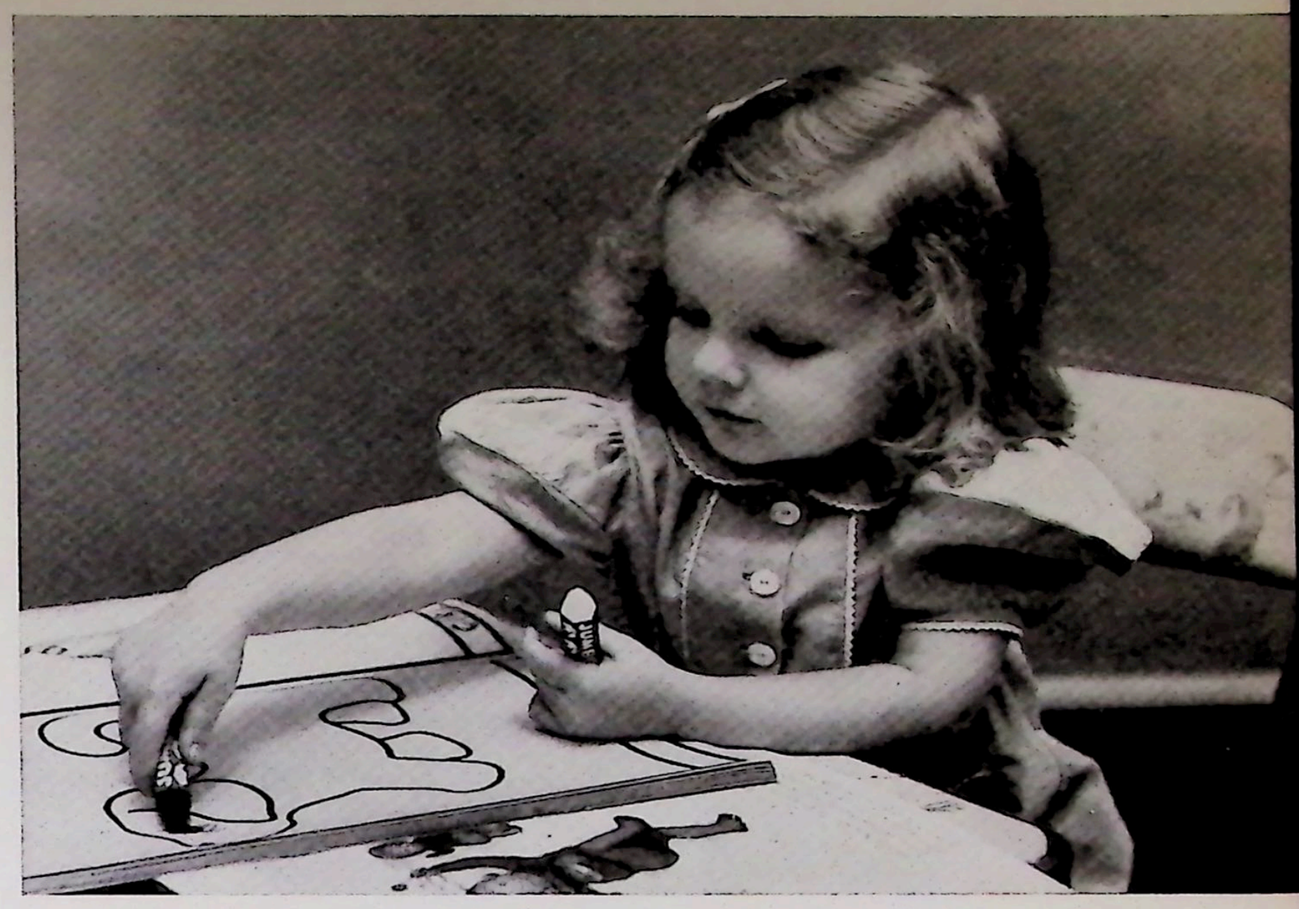
Carefully directed activities in the child's early years may mean a higher I.Q. level later on.

in this society of ours, and as a result the scores on these tests remain fairly steady. Studies have shown that adopted children grow to an I.Q. level which resembles that of their foster parents rather than remaining similar to that of their real parents. Evidence has also been obtained which seems to show that children who are encouraged early in life through the Pre-school and Kindergarten years acquire I.Q.'s somewhat above those who have missed this directed schooling.

When an exceptionally low I.Q. is discovered, and those below 70 (.70) are usually classified into varying degrees of feeble-mindedness, there usually appears in the reports on these cases very little evidence to show that these individuals can be encouraged into above-average I.Q.'s. Advanced, or even customary, school programs are not the type of intellectual food needed by these boys and girls. With these cases a below-average home environment is far too often found. On the other hand there are relatively few of these feeble-minded persons in our population as a whole. Most (in terms of people) differences in I.Q.'s fall between scores of 85 and 120, and we do not have real evidence to prove that these differences are due to heredity alone. Human experience is so complex that there may well have been during any child's life (any adult's as well) occasions, unnoticed and uncontrolled, which have had an effect on intellectual growth and development. It is easy to ignore all these influences of environment and to attempt to lay the full responsibility of the I.Q. score in the lap of heredity, but the easy way is not always the accurate way. Children of college professors quite often average higher I.Q.'s than those whose parents have other forms of employment. We can well ask, is this due to inheritance alone? Or might it not also be due to the fact that a child in a teacher's home will usually find from birth on an expressed interest in and a whole array of experiences which are in line with the very traits measured by these tests?

Be interested in all the many ways your children can be measured by these tests and others. Do not be influenced by rumor or by the numbers alone. To secure a reliable measurement of your child's ability, be sure that a trained worker has given and interpreted the tests. Unfortunately there are "quacks" in psychology as well as in medicine. Bumps on your child's head, or the width of his forehead are only some of these spurious signs used to confuse parents, and they are not used by the honest and sincere workers who are trying to help your child find his place in life. Today the teachers in our schools are better prepared to interpret for you what these scores mean, and, more important, their limitations.

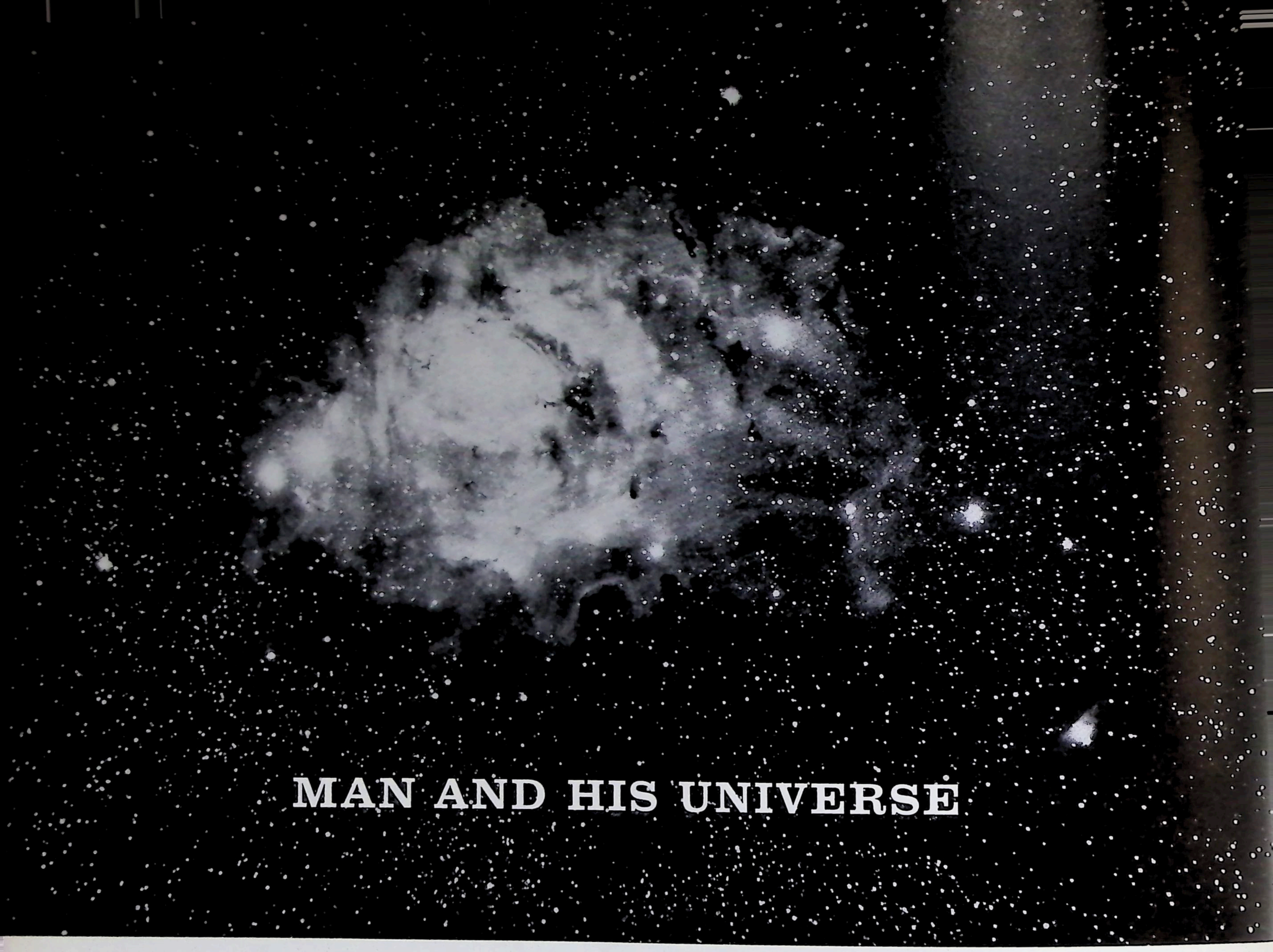
There is a place in society for almost every individual, and the limits which are indicated by the intelligence score still allow us to observe each child in ways which will help us to guide him toward happiness and adjustment to society. The I.Q. is important and has its place as a measure or comparison; but let us not regard it as an end in itself. ♦



A child at play, absorbed and interested, is a child happy in the discovery of a new world of imagination and fantasy.

Painting models of prehistoric animals captures the imagination of young minds, and helps young fingers to acquire coordination and dexterity.

Maintaining a classroom aquarium teaches responsibility and cooperation to elementary school students.



MAN AND HIS UNIVERSE

from the Wisdom of The Book of Knowledge

We live in a great system of stars that we call our Galaxy, or the Milky Way System. This is disc-shaped, like a man's pocket watch or a thin biscuit. There are billions of stars in our Galaxy and its size is so great that a pulse of light would need to travel for 100,000 years to get from one edge of it to the other. Although the Galaxy is very large, it has limits; and all around it is empty space. Our system of stars is only an island in the great ocean of space that we call the universe.

There are other islands in this great ocean. They are other stellar systems, other galaxies. They lie far off, in all directions, and in most telescopes they appear to be clouds of gas, and not swarms of stars at all. Those who first saw them through the telescopes we had a century and a half ago called them nebulae, and sometimes this term is still used. It is confusing to do so, however. It is far better to use the name nebulae when speaking of true gaseous nebulae, clouds of gas in our Galaxy lighted up by starlight. The great cloud-like masses in the far reaches of space are not nebulae, or clouds of gas; they are great systems of stars like our own and only their great distances made them look like nebulae in early telescopes.

The nearest galaxies outside our own are two irregular ones that can be seen easily with the unaided eye, if the observer is near the Equator or south of it. These are called the Magellanic Clouds, or Clouds of Magellan, in honor of the great Portuguese navigator, Fernando Magellan. They look like pieces of the Milky Way that have drifted off a little.

Only three out of every hundred galaxies outside our own are irregular ones like the Magellanic Clouds. Eighty of each hundred are spirals, like giant two-branched pinwheels. The remaining seventeen of each hundred look like cocoons, or shuttles. All of them consist of stars, however, although many of them are too far away for us to see the stars directly. We can say they are made of stars because others, that are closer to us, look exactly like them, and these nearer ones can be seen to be stars. But only by photography with great telescopes can we discern

the true nature of these distant star-cities; the eye at the telescope is not powerful enough.

There is a fine spiral galaxy in the constellation Andromeda; it is about 650,000 light-years distant from us, yet we can recognize in it the same kinds of stars and gaseous nebulae and star clusters that we find in our own Galaxy. That is how we are able to determine how far away these objects are; when we find a particular kind of bright star in the Andromeda spiral, we know how bright it really is and we see how bright it appears to be, so we know how far away it must be. No matter in what direction we look, we find these other islands in the universe. Like our cities on the earth, each one is some distance away from its neighbors on all sides and each one is most crowded at the center and thins out at the edges.

With the greatest telescopes in the world, almost 100,000,000 galaxies can be photographed! Each one, it must be remembered, consists of many thousands of millions of stars. In one of those many millions of galaxies, one of the many thousands of millions of stars is our sun. That will tell you how big you are in the universe! Of course, we do not see all of the universe. We can describe only the part that we can see; we call that part the visible universe. Probably the part that we do not see is simply the same thing repeated endlessly.

The most distant galaxies that we can select on our photographs today are 500,000,000 light-years distant. They appear as only tiny smudges on the pictures. Light that we are now receiving from them left them before the dinosaurs came into existence! It is fossil light that has been on its way for 500,000,000 years.

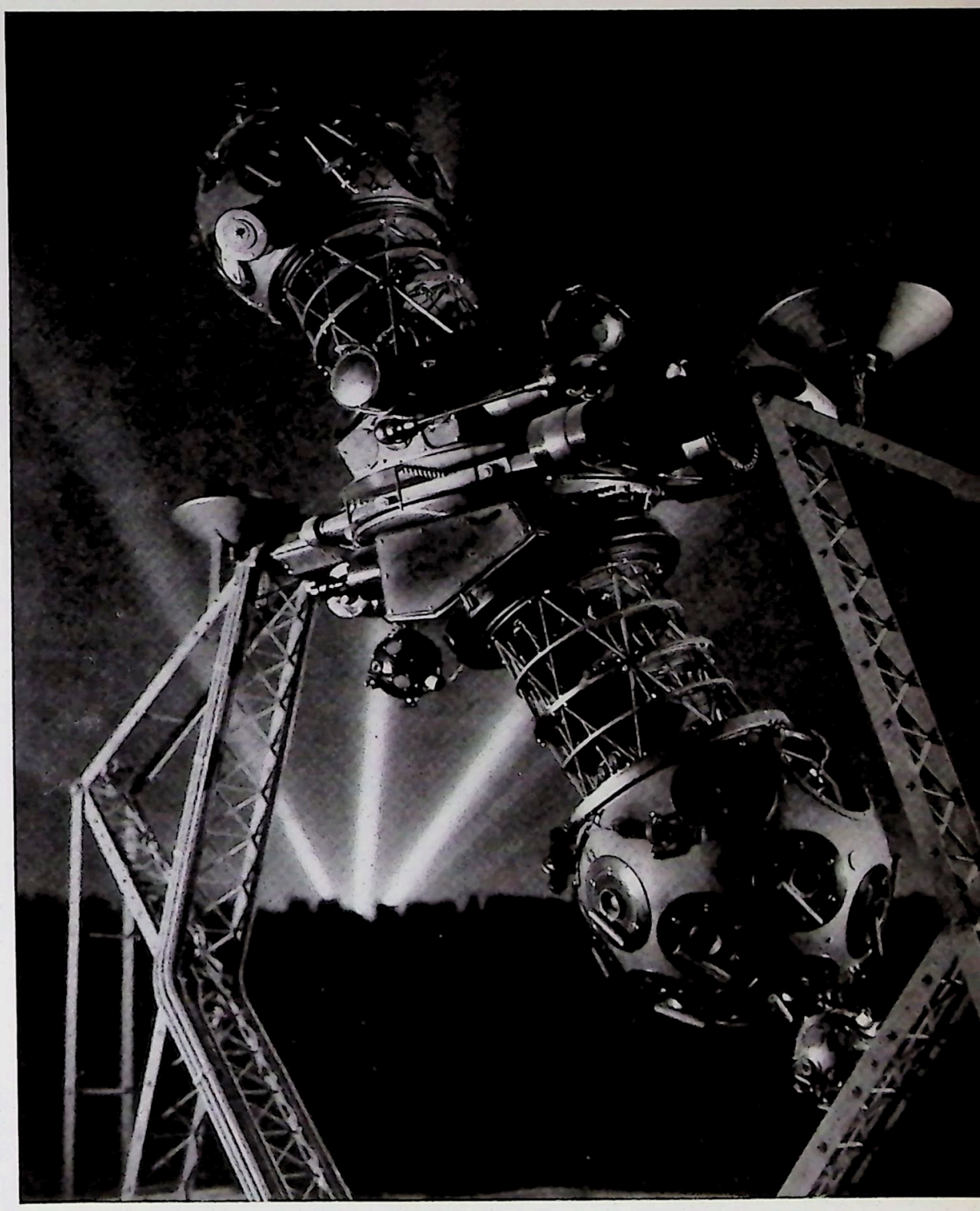
The most amazing thing we find in connection with the galaxies is that they all appear to be receding from us, and those farthest away appear to be going away from us with the greatest speeds. This is discovered by the use of the spectroscope. As the whistle of an approaching locomotive appears to be of higher pitch than the same whistle when the locomotive is traveling away from us, so light changes if the source of light is coming toward us or going away from us. This is called the Doppler effect, from the name of the man who brought it to the world's attention.

Using the spectroscope, we find that a star whose distance is increasing displays a certain effect. For a star whose distance is diminishing, the effect is in the opposite direction. From a study of these effects we learn how fast the distance is changing. We are careful to say that the distance of the star is increasing or diminishing, and not that the star is going away from us or coming toward us. Sometimes a star which is not moving at all will appear to be coming toward us, because we are going toward it. The earth revolves around the sun, and our motion shows up when we try to measure the motions of the stars. We must always subtract our motion to find how fast the star is really moving.

The distant galaxies all appear to be receding from us; even more interesting is the fact that the farther away a galaxy is the faster it appears to be going away from us. It is as though all other things in the universe were trying to get away from our solar system as fast as possible!

Many people who read or hear about this picture of the universe—great galaxies of stars stretching to endless distances in all directions—begin to feel small and insignificant. They stay to each other, "Man does not amount to very much, does he?" This is a very common reaction, but it is not a worthy one. We should think of man as the creature that must ride on his little planet, with—when all is said—only faint and sometimes confusing signals from beyond his own Galaxy to tell him what kind of universe he lives in. Only two of man's sense organs are of any help—sight and sound. Of these sound is but a feeble aid, for we have not yet gone very far in explaining to ourselves the meaning of those mysterious sounds our instruments have picked up from heavenly far-off regions.

Yet we have made great strides in the last two hundred years. We have discovered how hot the stars are, how big they are, what they are made of, how fast they travel and all the other strange and wonderful things we know about them. Man has even been able to make contact with the moon by means of radar. Surely it is no insignificant creature that has been able to do this. In all this great and fine universe of ours, the most remarkable thing is the mind of man. ♦



Projector in a planetarium.

KING ARTHUR

■

the
world's
best
known
hero

from the Wisdom of The Book of Knowledge

IN ROMANCE and legend, in music, poetry and art, King Arthur and his knights are among the world's best-known heroes. For centuries they have been favorites of the storytellers in many different countries and in many tongues. Today, in tales familiar to people throughout the world, King Arthur and his knights stand for golden deeds and high adventure and for the ideals known as chivalry in the Middle Ages.

The tales tell of Arthur's court at Camelot, of its noble towers and of the great hall with its huge Round Table, where knights of prowess sat. It was no easy thing to become a knight in the Middle Ages. Sons of noblemen were sent to court at the age of seven to learn the skills of falconry, hunting, wrestling, of tilting with spears and of horsemanship. Besides these delightful pastimes, they also had to learn good manners and court ceremony. They donned heavy armor for the first time at the age of fourteen, and they had to manage its weight so well that they could vault on a horse when wearing full armor. On the one hand they were trained to become adept at scaling walls and wielding battleaxes; on the other, they must master many refinements of courtesy. At twenty-one, if they were fit, they received the honor of knighthood. At Arthur's court a small group of knights who had proved themselves of very special worth were permitted to eat with the King at his table, the Round Table.

It is little wonder, then, that the knights of the Round Table are called the flower of chivalry. The word "chivalry" comes from the French *cheval,* which means "horse." In battle, in tournaments and in jousts, the knights were mounted on gallant chargers. It came about, as time went on, that the word "chivalry" referred not only to the knights themselves but also to their ideals of loyalty and courage, justice and mercy. One vow in particular sent the knights of the Round Table on many an adventure. This was the unbreakable oath to protect and help the weak and the distressed. There were evildoers in those days—unworthy kings and brigands and such—who had to be disposed of. More difficult were the monstrous dragons, breathing fire, and the giants who wrought havoc by dining on babies, captive duchesses and knights.

The people of the Middle Ages were the builders of the mighty cathedrals, which we admire so much today. They were a deeply religious people, and some of their favorite stories told of the quest of Arthur's knights for a sacred vessel called the Holy Grail. The quest could be achieved by none but a perfect, stainless knight. The Grail quest stories were told in many different lands, in those olden times; in some countries they were told in one way and in some they were told in another. In Germany, the knight who achieved the quest was Parsifal; in Britain, the hero who achieved the Grail was Sir Galahad, the son of Sir Lancelot of the Lake.

History tells us that King Arthur was a real person, a British chieftain, who lived in the sixth century A.D. In those days the power of the Roman Empire had declined; Rome was no longer able to keep order in the distant land of Britain, which was constantly harried by invaders. An early chronicler, Nennius, tells us that Arthur drove back the invaders in twelve great battles, and that on his shield he bore the image of the Blessed Virgin. From the beginning, it seems, King Arthur stood as a symbol of courage and of religious devotion. Nothing more is known of Arthur that could possibly be called fact. His prowess, however, had made him a popular hero, and legends and myths gathered thick and fast about him. An early writer, William of Malmesbury, spoke scornfully of the "deceitful tales and dreams" that the Britons told about their King. It was these dreams, however, that the people loved the best and that have inspired so many poets and other writers of romance.

The stories grew and changed with the changing times as they were carried from castle to castle and from land to land. In the twelfth century the French, who loved King Arthur well, remodeled the tales and gave them French courtliness and polish. But Arthur, as defender of his native land, has remained a British national hero. We have to go all the way back to the fifteenth century to find the most famous Arthurian prose in the English language. It was written by an Englishman, Sir Thomas Malory; and it was one of the first works in English to come off the press of the first English printer, William Caxton. He printed the book in 1485, some years after Malory had died. In spite of its title *Morte d' Arthur,* or *Death of Arthur,* it is a gay and joyous book. It moves with a swift simplicity; its English charms us with a feeling of things far off and long ago; and if sometimes we must pause to unravel its meaning, that is partly because words have a way of changing as years go by. After Malory had brought many of the olden tales together and retold them in his own way, his book became a great source for future writers.

"It befell in the days of Uther Pendragon," says Malory, and from there on the story moves. Arthur, the son of King Arthur and Igraine, was born when Britain was torn by war. Merlin the Magician knew that Uther's days were numbered, that the nobles would fight among themselves for power and that Uther's infant son would be in danger of his life. Listening to Merlin's good counsel, Uther commanded two knights and two ladies to take the babe, bound in a cloth of gold, and deliver it to a poor man at the castle's postern gate. The man was Merlin himself, who gave the child to Sir Ector and his wife to bring up as one of their own, not telling them that the child was King Uther's son.

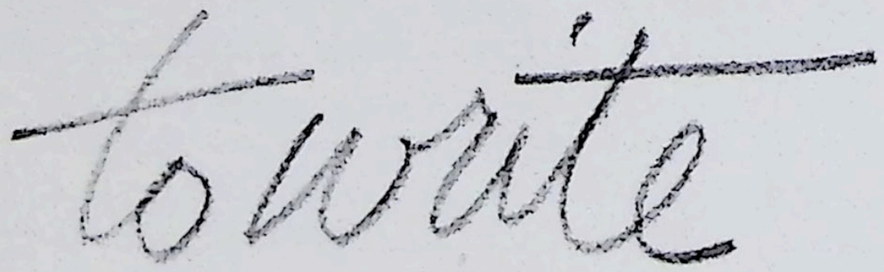
All came to pass as Merlin had foretold, with Uther's death and civil wars that ravaged the land during Arthur's boyhood. When the lad was well grown and the time was ripe, Merlin counseled the Archbishop of Canterbury to send for all the lords of the realm, that they should come to London by Christmas. Perhaps a miracle might take place to show who should be rightful king of the realm. Swords were of the greatest importance in those days and the proof of Arthur's kingliness depended on a wonderful sword. Malory tells us how, on Christmas Day, "there was seen in the churchyard, against the high altar, a great stone four square, like unto a marble stone, and in the midst thereof was like an anvil of steel a foot on high, and therein struck a fair sword, naked by the point, and letters there were written about the sword in gold that said thus: "Whoso pulleth out this sword of this stone and anvil, is rightwise king born of all England." Some who would have liked very well to be acknowledged king tried to pull out the sword, but none could stir or move it. Then the Archbishop set a guard of ten knights about the stone, saying "He is not here that shall achieve the sword, but doubt not God will make him known."

New Year's Day came, with a fine tournament for all the knights. And who should come to see the fun but Sir Ector, who had brought up young Arthur, and Sir Ector's son Sir Kay and, last but not least, young Arthur himself. As they rode on their way, Sir Kay was suddenly dismayed. He found that he had left his sword behind.

"So," writes Malory, "he prayed young Arthur for to ride for his sword. " 'I will well,' said Arthur, and rode fast after the sword, and when he came home, all were gone to see the jousting. Then Arthur was wroth, and said to himself, 'I will ride to the churchyard and take the sword with me that sticketh in the stone, for my brother Sir Kay shall not be without a sword this day.' " Lightly Arthur pulled out the sword and rode away to give it to Sir Kay. Now when a temptation is put right under your nose, it is sometimes hard to resist it. Sir Kay thought that he would like to be king as well as another, so he said to his father, "Sir, lo! here is the sword of the stone, wherefore I must be king of this land." Sir Ector, however, made Sir Kay swear upon a book how he came by the sword, and then Sir Kay spoke the truth. "Sir," said Ector unto Arthur, "will ye be my good and gracious lord when ye are king?" "Else were I to blame," said Arthur, "for ye are the man in the world that I am most beholden to, and my good fair lady and mother your wife, that as well as her own hath fostered me."

At Sir Ector's request, Arthur plunged the sword back again into the stone, and none of the barons could move it. At the Feast of Pentecost, however, when everyone else had failed, Arthur pulled it out in sight of all the lords and commons that were there, wherefore the commons cried at once "We will have Arthur unto our king." Everyone kneeled at once, both rich and poor, and Arthur offered the sword upon the altar where the Archbishop was, who made him a knight then and there. Soon Arthur was crowned, swearing unto the lords and the commons to be a true king, to rule with true justice, thenceforth all the days of his life. ♦

HOW MAN LEARNED



from the Wisdom of The Book of Knowledge

FROM very early times man has wanted to keep count of possessions, such as oxen or goats or sheep, and also to mark the passage of time. For this purpose men used to make notches in sticks or knots in strings. Later these notches and knots were used, in some way that we do not understand, to record laws or historical events. The Incas of Peru kept their records by means of knotted cords called quipus.

In very early times, people began to make pictures of the animals that they hunted in the chase or that roamed through the woods about them. The cave men ornamented pieces of bone and horn and the walls of the caves in which they lived with pictures of men and animals. Later the pictures were used as symbols, or signs, to give messages. Of course, it would have been unfortunate if the man who received a message misunderstood it—if he mistook an invitation to a feast, for example, for a threat of war. So it was agreed that the pictures of certain parts of the body, or plants or animals should always be used as symbols to mean certain things, and that is how writing began.

The Indians of the New World developed elaborate systems of picture writing which some of them have used even down to the present day. In the Old World, however, as the years went on and the chiefs of tribes became great men and kings of nations, they were not satisfied that their deeds should be handed down only by word of mouth. They feared that men might forget what they had done or that an enemy might tell another tale. So they began to set down the record of their deeds, not in books such as we have but on stone or on bricks or tiles.

The ancient Egyptians used beautiful picture writing, which was carved or painted on the walls or pillars of their palaces, temples and tombs. This picture writing is called hieroglyphics, from two Greek words meaning "sacred carvings." In this kind of writing, pictures of men and women, animals, birds, plants, clothing, tools and weapons originally stood for definite objects. A picture of an arm stood for an arm; a picture of an owl, for an owl. In time this or that picture came to represent not merely a single definite object but all things pronounced in the same way. That is, a certain picture came to stand for a definite group of sounds. Later, certain picture signs came to represent single sounds in Egyptian hieroglyphics. The picture of a palm leaf stood for the consonant *y*; the picture of an owl, for *m*. This represents the earliest known form of an alphabet.

In addition to hieroglyphics, the Egyptians also used hieratic writing, an abridged or shortened form of hieroglyphics. Later they also used demotic writing. This is a simplified form of hieratic writing and it was used for the ordinary business of life—for business correspondence, contracts, civil documents and so on. Hieratic and demotic writing were done chiefly on a material called papyrus. It was made of the pith of the papyrus plant (a kind of reed), cut into slices and pressed together. We get our word "paper" from papyrus. In time the ancient Egyptian writing was forgotten, and for centuries no one was able to read the old messages. Then, in 1799, near Rosetta, Egypt, a stone was found on which there was a message in three languages: hieroglyphics, demotic writing and Greek. Using Greek as the clue, scholars were able to work out the writing in the other two languages. From that beginning they worked out a good general understanding of hieroglyphics. The stone that gave the key to so much knowledge of the past is called the Rosetta Stone. It is now in the British Museum, in London.

The Sumerians, who lived in Mesopotamia, in western Asia, wrote on clay tablets or cylinders because there was no stone. The writing was done by pressing a sharp pointed instrument, called a stylus, into damp clay. This made the clay spread at one end so that the mark looked something like an arrowhead, or wedge. Hence this kind of writing came to be known as cuneiform, or wedge-shaped. In the beginning, cuneiform was picture writing. In time, however, the pictures were made with such simple lines that they no longer looked like birds or animals or plants. The Babylonians learned this kind of writing from the Sumerians and then passed on their knowledge to the Assyrians. While Athens was yet unbuilt and the seven hills of Rome were wooded slopes, the Assyrian capital of Nineveh had a great library with thousands of books written on clay tablets lining its shelves.

It was the Phoenicians, a people living on the coast of Syria, who perfected the first practical alphabet. They did not invent the signs that

they used in their alphabet. They took the simplest signs from an earlier system of picture writing and used these signs to represent the sounds that they heard in the human voice. Many scholars think that the Phoenicians got these signs from the Egyptians; others say the Phoenicians learned them from some of the Syrian peoples; still others say that the Phoenicians took the alphabet from Crete. At any rate, the Phoenicians taught this new way of writing, with an alphabet, to the Greeks, who changed it somewhat and added signs for vowel sounds which the Phoenicians had not used.

The Romans took over the Greek alphabet, making many changes in the written letters. The Latin tongue, used by the Romans, became the official language of the Roman Catholic Church. Missionaries spread a knowledge of the Latin alphabet throughout western Europe, and it was adopted everywhere in that area. Today we use this alphabet, as do many of the other people of Europe and the Americas. The Russians do not use it, nor do the Turks, the Greeks, the Chinese and many other peoples.

Our written English has changed very much over the centuries. In the Middle Ages, writing was done in all capitals, with no spaces between the words and no punctuation. As books multiplied and libraries grew larger, the monks, who copied most of the manuscripts, learned to make their letters smaller, and large letters were used only as capitals for the beginning of sentences and for names. However, the monks continued to write each letter more or less by itself as a separate unit.

Of course, many men besides the monks learned to write in the Middle Ages. Merchants and lawyers, the secretaries of great men and many others found it necessary to learn to read and write. These people could not take time to write beautiful manuscripts, and rapid script, with the letters of each word joined to one another, came into use. When the printing press was invented, however, it was the beautiful "book hand" writing of the monks that was adopted by the printers.

In the ninth century, the Moravians and Bohemians were converted to Christianity by a Greek monk named Cyril. Cyril, who was a learned man, made an alphabet in Greek characters for the Slav language so that his new converts could learn to read and write. The Russians, who are also Slavs, learned this alphabet, and Russian writing still bears a strong resemblance to the Greek.

The Chinese have never had an alphabet. Countless generations of Chinese children have had to learn thousands of characters, each standing for a word or a syllable. The Japanese borrowed this method of writing from the Chinese. However, though they use many Chinese characters in their writing, their language is altogether different from Chinese.

The ancient Greeks and Romans wrote their laws and public records in early days on stone and bronze tablets. Later they used parchment and papyrus for ordinary writing purposes. The Romans had a very ingenious way of taking notes and writing personal messages. They carried with them tablets made of wood or metal and covered with wax. They wrote upon them with a stylus of metal, bone or ivory. When the material written on the tablet had served its purpose, the wax surface was smoothed with the blunt end of the stylus. The tablet was then ready for other writing.

The men of western Europe continued to use papyrus for some time after the fall of the Western Roman Empire in 476. Then, when papyrus became scarce, parchment came into general use. All the beautifully illuminated manuscripts of medieval times were written on vellum, a fine parchment made from the skins of very young animals.

Though the word "paper" comes from the Egyptian papyrus, most scholars hold that this ancient writing material was not really paper. It is said that paper was invented in China by a man called Tsai Lun, a high official who lived about two thousand years ago. He used the beaten fibers of the inner bark of the mulberry tree; when these fibers were matted together, they formed a white sheet.

In the eighth century, the Arabs of Bagdad and Damascus began to make paper. It is generally thought that this substance came to Europe by way of Spain, which the Arabs and other Mohammedan peoples had conquered in the eighth century A.D. At any rate, there were paper mills in Spain, Italy and France in the twelfth century. As time went on, paper gradually replaced parchment, which is now used only for special purposes and in very small quantities. ♦

In some ways nations and races are like neighbors living in a city block or in a suburban community. The better understanding they have of each other, the more they get out of their lives. Their understanding begins when they learn to share their laughter. But it is not always easy for people who speak different languages to laugh together. They must find a common medium of entertainment. A close relationship follows when this medium is found. The language of our neighbor nations is no more understandable to us than ours is to them. It was natural therefore that the movie screen should have been considered to bridge this gap. We found early in our experience that the motion picture was a medium that could be adjusted to the universal differences of language. — WALT DISNEY

THE RACES OF

The American Indian, according to scientists, is believed to have come to this continent from Asia many centuries ago.

Indian and papoose—a comfortable, convenient way to carry small babies. This allows hand freedom for the mother, but gives the baby the needed security of bodily contact.

The intricate Eagle Dance, performed by the White Cloud brothers of Jemez Pueblo, New Mexico, is one of the most exciting Indian dances.

Hopi Indian of First Mesa, Arizona puts finishing touches on a pottery bowl while her young son watches and learns. Tribal origins are shown in both color and design, and handed down from generation to generation.

MANKIND

Peoples of the World

from the Wisdom of The Book of Knowledge

SOONER or later we observe that people differ in color, size, kind and amount of hair and so on. It is not so easy to divide people into kinds as it is to divide automobiles or airplanes or animals. Learning takes longer, and on the way we may sometimes pick up prejudices, wrong ideas. Then we have to do some unlearning before we come really to know the races of mankind.

This picture of us growing up and learning about kinds of people is very similar to what must have happened on a larger scale in the history of mankind. We have good reason to believe that many thousands of years ago mankind was undergoing a sort of infancy and childhood; that is, the people living way back there in time were in the process of learning about simple things that we, even as children, now take for granted. They learned slowly how to make clubs; then they found spears more effective; next they fitted small spears to bows to make them go farther; then they made the big jump to guns and so on.

Somewhere in the course of this childhood of mankind, just as in the case of our own childhood, men met other men who were different in appearance. At first it was sufficient to refer to different kinds simply as "the strangers who live on the other side of the mountains" or "those over the water." But the time came when a better classification was needed.

By the time men had learned to record their thoughts on stone—some 5,000 to 6,000 years ago at least—they had classified the people then known to them. We see this best in Egyptian wall decorations painted more than 3,000 years ago. According to these pictures, the Egyptians recognized four kinds of people: (1) themselves, whom they painted red; (2) the near-by Asiatics, yellow; (3) the Southerns, or Negroes, black, with thickened lips; and (4) the Westerners, or Northerners, white, with blue eyes and fair beards. From the Egyptians the study of human races passed mainly to the scholars of Europe. As the world was fully explored and many peoples and animals hitherto unknown were discovered, the study of forms of life became very complex.

It was not until 1735, forty years before the American Revolution, that a scientist produced a classification of the various forms of life, including mankind, that satisfied most requirements. He was a Swede, Carl von Linné (his name is usually Latinized to Carolus Linnaeus.) In the Linnaean classification every form of life receives a double name. The first part of the name indicates the general group, or genus (plural—genera), to which the form belongs; the second part indicates a subgroup, or species. The names are usually derived from Latin or Greek. For example, *Homo sapiens* (*homo* means "man" and *sapiens* means "wise") is the name given to mankind of today. *Homo* stands for the genus, *sapiens* for the species. In addition to his two-name system, Linnaeus recognized that in some cases still finer subdivisions had to be made. These are known as subspecies, or races. Races are not sharply defined; often they merge. Linnaeus himself identified four varieties of mankind: American (the "red" Indians), European (white), Asiatics (yellow) and African (black). Some scientists regard races as species in the process of formation.

The scientific classification of mankind is strictly biological. By this we mean that nothing outside of the human body is taken into consideration. People dress differently in different parts of the world, but clothing has nothing to do with race. The same is true of religious belief and citizenship. Catholics are not a race, nor are the French and Spanish. The former are a religious group; the latter are nationalities. All members of a race do not necessarily speak the same language. Thus, if we want to use the word "race" correctly, we should be careful not to say such things as "the American race," "the Jewish race" or "the Filipino race." By our definition there are no such races. On the other hand, the expression "the human race," although not entirely correct, may be used, for it is only another way of saying "mankind"; in other words, it is a figure of speech.

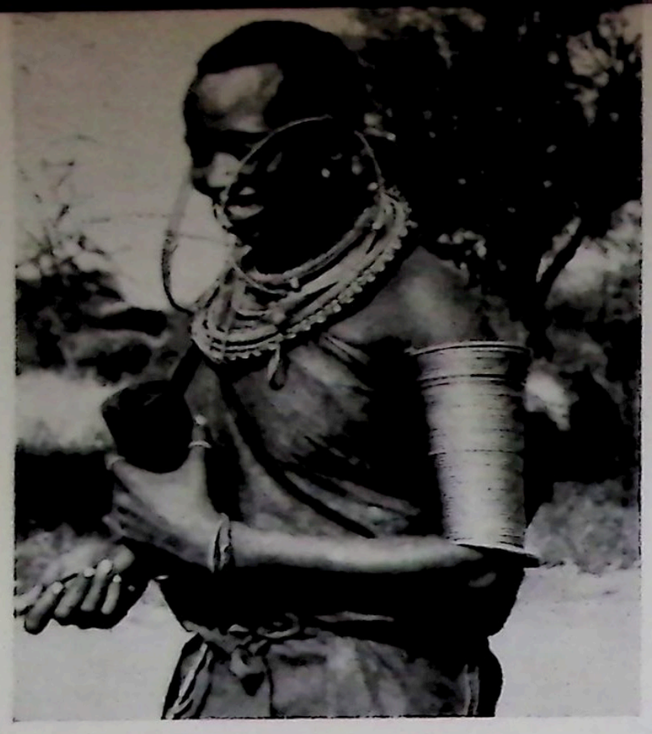
The process of developing the variations that we call races began so far back in time that there are no records as to how it came about. But anthropologists—those who study mankind—have some clues. They note where races live now and under what conditions they live, and the present tells them something about the past. They get help, too, from studying what has happened in the case of lower animals.

The four main racial groups mentioned by Linnaeus and named by color are found mostly on different continents. Ignoring recent migrations, the Whites seem to have been in Europe for a long time, and the same is true of the Blacks in Africa and the Yellows in Asia. We believe now, also, that the so-called "red" Indians came to the American continents rather recently from Asia, so they are closely related to the yellow peoples and are not really red. Thus, long isolation may be one cause of racial differences.

Climate is another cause. Asia is the coldest continent; Africa is the warmest; Europe may have had a long history of fog and scanty sunshine. Accordingly, the Asiatic peoples seem to show some physical adaptations to cold, especially in the structure of the face, a part that must always be exposed. Dark skin in Africa may be a protection against the hot sun, whereas white skin in Europe enables the people there to make full use of limited sunlight. It is thought that the individuals who were not fitted for these environments did not survive.

Now, while the forces of nature were everywhere trying to change man's form, he himself, quite perversely, was ever on the move, thus counteracting nature's efforts. Perhaps it was the search for food that led him from one locality to another. Or a group became powerful and seized their neighbors' land, driving the neighbors elsewhere. Or natural curiosity led individuals to see what was over the horizon and thus to start a migration in that direction. Whatever the reason—hunger, war or curiosity—population movements have gone on for untold centuries. Among the latest of these migrations—one that is still in progress—is the peopling of the New World from the Old. As a result, cold-loving Europeans and Asiatics now live in the American tropics, and heat-loving Africans now live in the American temperate zones. All of this has tended to keep physical or racial distinctions in check.

In addition, population movements, by bringing peoples together, have led to intermixture. All of us are aware that the peoples who have come to America have intermarried. The American Negroes are now various mixtures of Africans and Europeans. There are mixtures of Europeans, American Indians and Asiatics. In the past such mix-



Climate is considered one of the primary causes of racial difference. The dark skin of the African is a protection against the hot sun of his native land.

AFRICAN

Africans can tell at a glance the meaning of ornaments, facial markings and costumes which designate a particular tribe, or a specific ceremony.

tures occurred on a small scale and mainly along the contact zone between diverse groups. Nevertheless, in the course of time intermixture, like migration, has played its share in keeping racial distinctions in check.

The race idea as here explained is simply an attempt to arrange people according to their physical appearance. Today some scientists are not satisfied with this simple idea; they feel that such things as skin color and hair form do not adequately show man's past history; they propose, therefore, to divide mankind on the basis of unseen traits, such as blood groups. Their reason for wanting to use these unseen traits is that the mode of inheritance is, in a few cases, better known. The idea has merit, but unfortunately not many traits are well understood from the standpoint of inheritance. Also, efforts to classify people by blood groups have led to results almost identical with those now in use. This may mean that the unseen blood groups, like the visible traits, reflect about equally well mankind's history of migration and intermixture.

Although each of the main racial groups had its origin on, or was largely confined to, a continent: the Whites in Europe, the Blacks in Africa, the Yellows in Asia, and the "Reds" in America, there have been some Blacks in Europe, some Whites in Asia and so on since early times. However, this grouping does not account for Australia and the Pacific islands. The peoples of the Pacific are sometimes referred to as the Browns.

The people of northern Europe tend to be tall and of a light complexion—even blond. In the southern part of that continent they are shorter and of brunette coloring. These extremes represent two racial elements called Nordic and Mediterranean. An intermediate group that has remained distinct in central Europe is called the Alpine race. Also, the northern Lapps seem to be distinct enough to be called a race.

The brunette Mediterranean race is not restricted to Europe, but extends all around the Mediterranean Sea and eastward through the Middle East into northern India. Some of the peoples of northeast Africa are darker still and have been called the Hamite race. It is not until we get well into Africa that we meet really black people. These occupy the hotter parts of the continent and can be divided into Bantu in eastern and southern Africa, Bushmen in southern Africa, Forest Negroes in western Africa and Negritos (Pygmies) in south-central Africa.

Since Europe and Asia really form one huge continent, it is not surprising that the Eur-Asian peoples gradually merged. Much of this is due to the invasions of Europe by Asiatics in early historic times. In Asia proper, however, more or less distinct Mongoloid races prevail. In addition to their yellow skin, the Mongoloids have straight black hair and a characteristic type of eye fold. It is not easy for Westerners to tell the various Mongoloid groups apart.

From Asia, in ancient times, migrations moved northeastward and southeastward. It was to the northeast across Bering Strait that the ancestors of the American Indians moved. In the course of 10,000 to 15,000 years, the Indians occupied the whole of the Western Hemisphere. In the process they developed regional differences, but not enough to put them in different races. Yet the various Indians differ from the more Mongoloid Eskimos who occupy much of the Asiatic and American Arctic lands.

The migration out of southeastern Asia was much older and more complicated. White, Black and Yellow racial elements had a part in it. In southern Australia the ancient White element formed what is now known as the Murrayian race; in northern Australia these Whites intermixed with the Negroid element to form what is called the Carpentarian race. Elsewhere in the Pacific the three racial elements occupied vast island clusters and developed into distinct races known as Melanesian (predominantly Negroid), Micronesian (somewhat Mongoloid) and Polynesian (somewhat like Whites). Another remnant of the ancient White strain appears in northern Japan and is known as the Ainu race.

In this broad outline of the races of mankind no effort has been made to list in detail their physical peculiarities. Only skin color has been stressed. Some races are tall, some short; some have straight hair, and in others the hair is curly or even kinky; some are thickset in build, others lanky. It is not as important to know these details as it is to understand the meaning of race and to use the word correctly. ♦

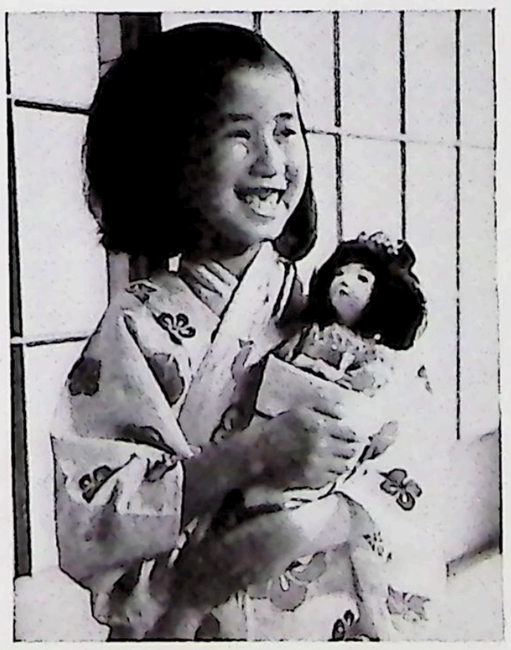
Father and baby daughter enjoy the evening bath in water heated almost to the boiling point. Like most Asiatics, the Japanese families are closely knit groups.

JAPANESE

The Japanese have a proud, ancient civilization rich in symbolism. The marriage ceremony ends with the bridegroom reading a written declaration of promises to his ancestors.

Like the Indian and African, the Japanese farm wife has no baby-sitter problem. The child rides and sleeps comfortably in a sling on the mother's back.

Japanese women, barred as performers in the Kabuki Theatre, are trained from childhood to perform the ancient dances. This member of the Shojo Kabuki dancers appears in costume.



Young Japanese girl (left) plays with her doll after completing her daily household chores. School age youngsters (right) enjoy the simple breakfast of rice.

GREEK

Traditional Greek costumes, displayed now only on special ceremonial occasions, were originally the military uniforms worn by shepherd boys of Peloponnesus in 431 when they fought in the war between Athens and Sparta.

SCOTCH

Scottish bagpipers wear a modern version of the centuries-old uniform, a skirt formed by a huge piece of tartan cloth plaited or "kilted" on one end, with the unkilted section brought over the shoulder as a jacket.

Hawaiians are a happy people of an island paradise. They express their natural uninhibited gaiety in colorful clothing, bright flowers, and brighter smiles.

With a skill born of years of experience, and careful not to frighten the keen eyed fish, a Hawaiian fisherman casts his throw-net with faultless timing at the instant when the water is covered with foam.

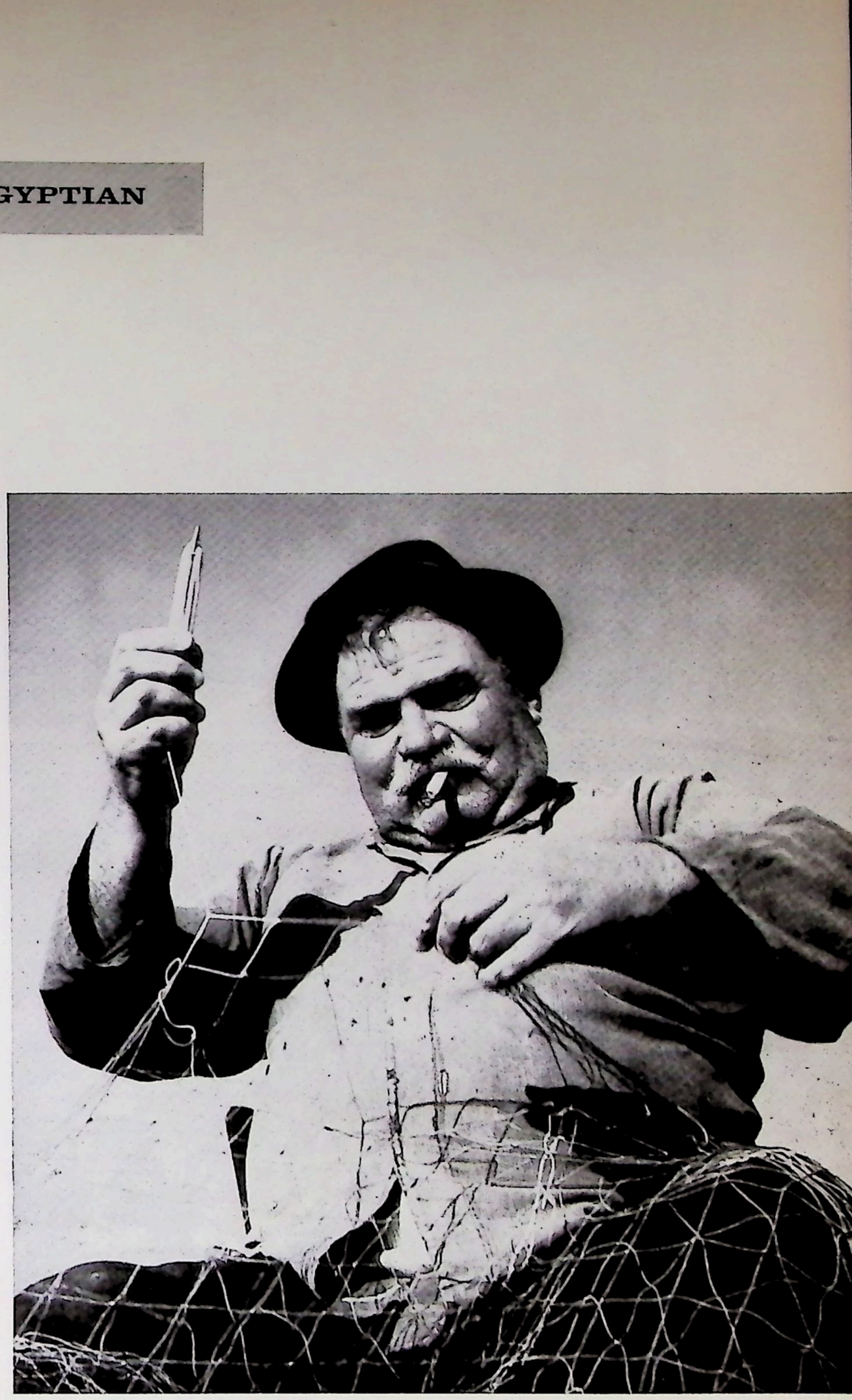
HAWAIIAN

Any excuse is used for a Hawaiian celebration, and the entire village—from the oldest to the very youngest—turns out for the festivities.

Egyptian cameleers pause to rest along the Nile as they drive their camel trains over a well-worn path in the desert sands.

EGYPTIAN

Students studying in the library of one of the four villages selected as "classroom communities" by the Arab States Fundamental Education Centre.

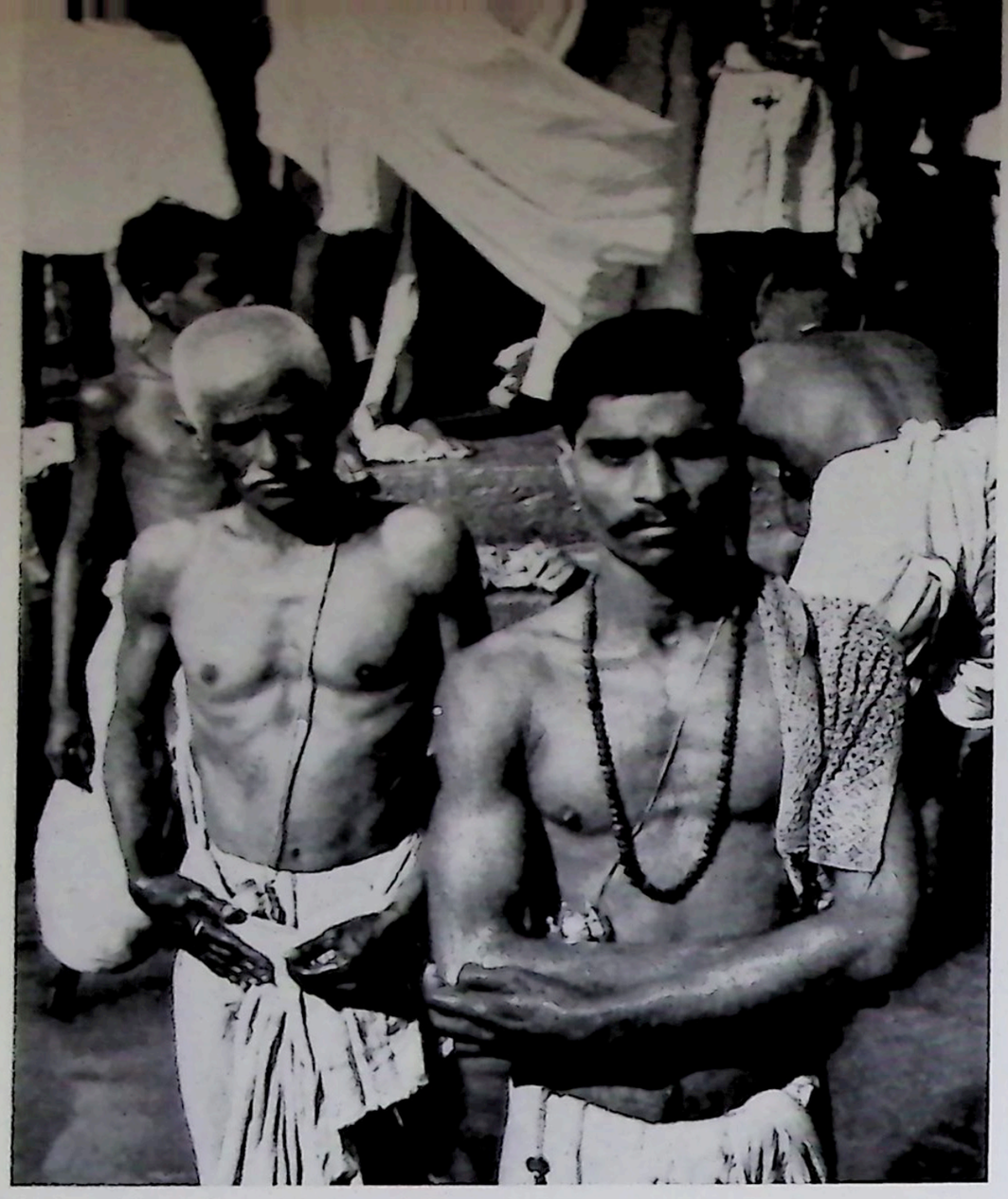


Most nationalities adapt physically to the terrain in which they live. This Swiss fisherman, very carefully mending his net, is big and hardy—like the Alpine peaks that are part of his homeland.

SWISS

Taking care of the goats is a chore of most Swiss farm children, and very often the kids become warm, loving pets.

Sturdy Swiss townspeople walk from the village to the mountain pastures to rake the summer grass. Surrounded by beauty, they accept the majestic mountain peaks of their native land as part of their national heritage.



India teems with millions and public bathing is a problem. For many the daily bath and the clean "dhoti" (loin cloth) before dinner is a religious rite.

Although Indians look to tomorrow, the pageantry of today is a firm part of their lives. Because the roads are better suited to elephants than to automobiles, important personages are still chauffeured in this ancient way.

INDIAN

Indian youngsters, including girls, are enrolled in a school in Haldvani. This 8-year-old girl is being taught to write by the elderly teacher.

SPANISH

The Spanish cling to their customs and costumes of the past. Here, where they may be properly chaperoned, a young Caballero woos his Senorita in the courtyard of her home.

CHINESE

Bright-eyed young Chinese girls, wearing the costume of their native land, delight in taking care of new family members. Each is charged with the responsibility of someone younger.

The Chinese peasant has been trained through the centuries for rigorous toil. With his ever-useful bamboo pole, he is ready for a day's work in the rice fields.

FRENCH

The Goblet Dance of the Basques in costume. These are a mysterious people whose origins have never been determined.

At the Montmarte, French connoisseurs vie with each other to taste the vine-ripened grapes. The children, too, have filled their small baskets with the fruit.

"Springtime in Paris" means not only the city, but the beautiful, budding countryside as well. French girls pluck fresh fruit from the trees as they pass.

ARAB

Arab culture is a world of Shieks, Bedouins and camel-trains plying their trades in the shifting desert sands.

Gaily bedecked Arab girls perform an ancient dance known as "The Agoual." The beads and baubles are a part of the authentic costumes.

ENGLISH

The English gave the world a blueprint for a democratic form of government, without losing their own rituals and ceremony. Here a British band parades before Buckingham Palace.

ISRAELI

Israel, a new nation with an old culture, where Israeli women are trained to protect their homeland, whether by shouldering arms or directing traffic.

All the charm and crisp beauty of the land of Norway is represented in the bright faces of these young Norwegian girls dressed in native costume.

NORWEGIAN

ITALIAN

Italy is a dramatic country of fine music, good food, magnificent paintings. All three are represented in the laughter-loving Italian people.

AUSTRIAN

Austria is as famous for its wine as for its music. Vintners pick up heavy casks of selected grapes which they carry on their backs to the wine-press.

SIAMESE

Thailanders confer honor on their children by careful training for Palace Dancers. They are painstakingly taught over a period of years in the art of the Siamese dance.

TIBETAN

Tibetans are part of an ancient culture, an ancient religion. Living on the almost-inaccessible rim of the world, the Tibetans have remained untouched by modern civilization.

DUTCH

The sturdy, thrifty Dutch people have changed little throughout history. Even their everyday costume remains the same, including the wooden shoes which are worn only outside their homes.

WHAT IS A CLASSIC?

from the Wisdom of The Book of Knowledge

MANY years before the Christian Era, someone wrote a book that is called Ecclesiastes. It is one of the books that became a part of the Bible. The writer had a very interesting mind; some of the things he said more than two thousand years ago we still quote, because they are as true today as when he wrote them. Sometimes even more true. One of the things the author of Ecclesiastes said is, "Of making many books there is no end." This seems a very strange thing for him to say, for there were not nearly so many books in his day as in ours. The printing press was not invented until hundreds of years after he lived. Books were all written and copied by hand.

These manuscripts were often very beautifully written and illustrated and were very precious. They were not made for people to handle and read the way we handle and read almost any book today. This did not matter much, however, for most people could not read. There were no common schools to teach them to read. It was usually only the boys who were to become religious or political leaders or who belonged to wealthy families who were educated. Girls seldom learned to read, for very few people could imagine that a girl would ever have any use for such knowledge as she performed household tasks.

One wonders what the author of Ecclesiastes would have said if he had lived in the twentieth century, when thousands of books are printed every year in almost every country of the world. It is indeed much more true in our time than it was in his, "Of making many books there is no end." Today, books are so plentiful that most of them are quickly forgotten. That does not mean they are not useful or do not give a lot of people pleasure. But it does not matter whether one reads them or not. They are like many of the movies one sees—enjoyable, but after a week or two one can hardly remember what they were about.

In every age, however, whether many or few books are made, there are some that are more true and beautiful than all the rest, and a reader can never forget them. He keeps talking and writing about them because he wants to share his pleasure with everyone else who reads. To become famous a book must not only be read. It must be read by people who cannot forget it and who will make it known to others. To do this it must make a deep impression on their hearts and minds. It must help them to understand life better, to think more about it and to love it more. This is the only way a book can become famous.

Some of the most wonderful books that have ever been written have been lost forever. Others have been lost and rediscovered after many centuries. Even today we are finding some of them in cities buried under so many layers of earth and sand that whole new cities have been built over them, without anyone's suspecting the treasures lying under the new streets and houses. The curious thing about a true and beautiful book is that it can be lost for hundreds of years, and when it is found it is as important as it ever was—sometimes more important, because it tells man things he once knew about life and has forgotten. To find such a book is an exciting discovery. But for the individual boy or girl, or man or woman, it is no more wonderful than to find a great book on a library shelf. To hunt and find such a book is one of the great adventures which readers have that other people do not have.

Because of the printing press, there are today thousands of copies, sometimes hundreds of thousands, of the same book. Since we have so many copies, books that become famous nowadays cannot be as easily lost as the great books of ancient times, even though they are printed on paper, which is much more perishable than parchment made from the tough skins of animals. The only reason some of the famous ancient books were not completely destroyed is that they were written on parchment in Mediterranean lands, which have a dry, hot climate. It takes a very long time for parchment to rot in such a climate, and parchment does not burn easily, so the old books were not so easily destroyed by fire as books of today. Nevertheless, of all that was written in ancient times only fragments remain. We know from the writings of other ancient authors that Sappho was one of the greatest poets who ever lived, but very few of the wonderful poems she wrote survive.

It is easy to think that because a book is famous everyone will want to read it. This, however, is not true. Many famous books are seldom read because it takes a little trouble to get acquainted with them. They do not display their treasures on the first page. Authors of the past wrote for readers who had more time for what we call background before getting to the story. To have the background often increases the pleasure of a story, but the radio and the movies have accustomed us to a fast pace in writing. Much of what was once valued in a book makes modern readers impatient. People today feel like saying, "Get on with the story," when an author explains how he came to write his book or describes the scene and the customs of the people he is going to write about. To discover why some novels are famous one has to accompany an author

Richard Todd, star of the Disney film "Robin Hood," studies the life of the famous 12th century adventurer at the Nottingham Library in England.

quite a stretch listening to such talk and even be willing to get a bit bored and tired before the story starts. *Lorna Doone* is such a book, a wonderful story for readers who don't try to rush the author. Not all famous books are like this. There are some that cast a spell almost before you turn the first page. A good example is *The Black Arrow*, by Robert Louis Stevenson. It begins on a note of excitement: "On a certain afternoon, in the late springtime, the bell upon Tunstall Moat House was heard ringing at an unaccustomed hour."

A great book often thrills us by saying things we feel a need to say but cannot. Everyone who lives knows what it is like to be happy and sorrowful, to long for things and not to get them, to laugh and cry and worry, to shout for joy. Not to find words to express such emotions makes us feel bound. A book often frees us by expressing such common emotions. The people in the book feel as we do but are freer to act the way they feel and so make us feel free. We share their ambitions, their joy at success, their heartbreak at failure. The secret loves and hates that burden their lives seem like our own.

Some of the world's famous books are read and studied in school. Teachers and students call them classics. This word was first used only for the works of Greek and Roman authors. During the Renaissance these works came to be considered of great value in educating young minds, and their study formed an important part of the school course.

There was a long period during which western Europe knew largely only through hearsay of the great books the Greeks and Romans had written. To be sure, there were scholars even in the so-called Dark Ages who knew at least some of these books, and from the twelfth century on there was a growing interest in the way the ancients had thought and lived. Yet it was not until the capture of Constantinople by the Turks in 1453 that many of the Greek and Latin manuscripts became available to the Western world.

Constantinople was a great city and an important center of learning. When it fell to the Turks many of the scholars living there fled to Italy, taking their manuscripts with them. From Italy some of the manuscripts were carried to other countries of western Europe. Scholars who had an opportunity to read and study them for the first time were so impressed by their truth and beauty that they began to copy and translate them for use in schools. They called them classics, from the Latin word meaning "of the highest class." Today, therefore, when we speak of a classic in any language, we mean one of the best books written in that language.

Some of the Greek and Latin classics that were taught in Europe in the fifteenth and sixteenth centuries are still taught in our schools and colleges—Homer's *Iliad* and *Odyssey*, Virgil's *Aeneid*, Cicero's orations. Since most of the famous books of Europe have been translated into English, we can read not only *Little Women* and *Tom Sawyer* and *Treasure Island*, but *Don Quixote*, translated from the Spanish, *Les Misérables*, from the French, and many other great books not originally written in English. Reading the famous books of other lands helps us to appreciate what is true and fine about those countries and to see that people everywhere are much more alike than they are different. One of the best ways for the peoples of the world to become friends and live at peace with one another is for them to read each other's famous books.

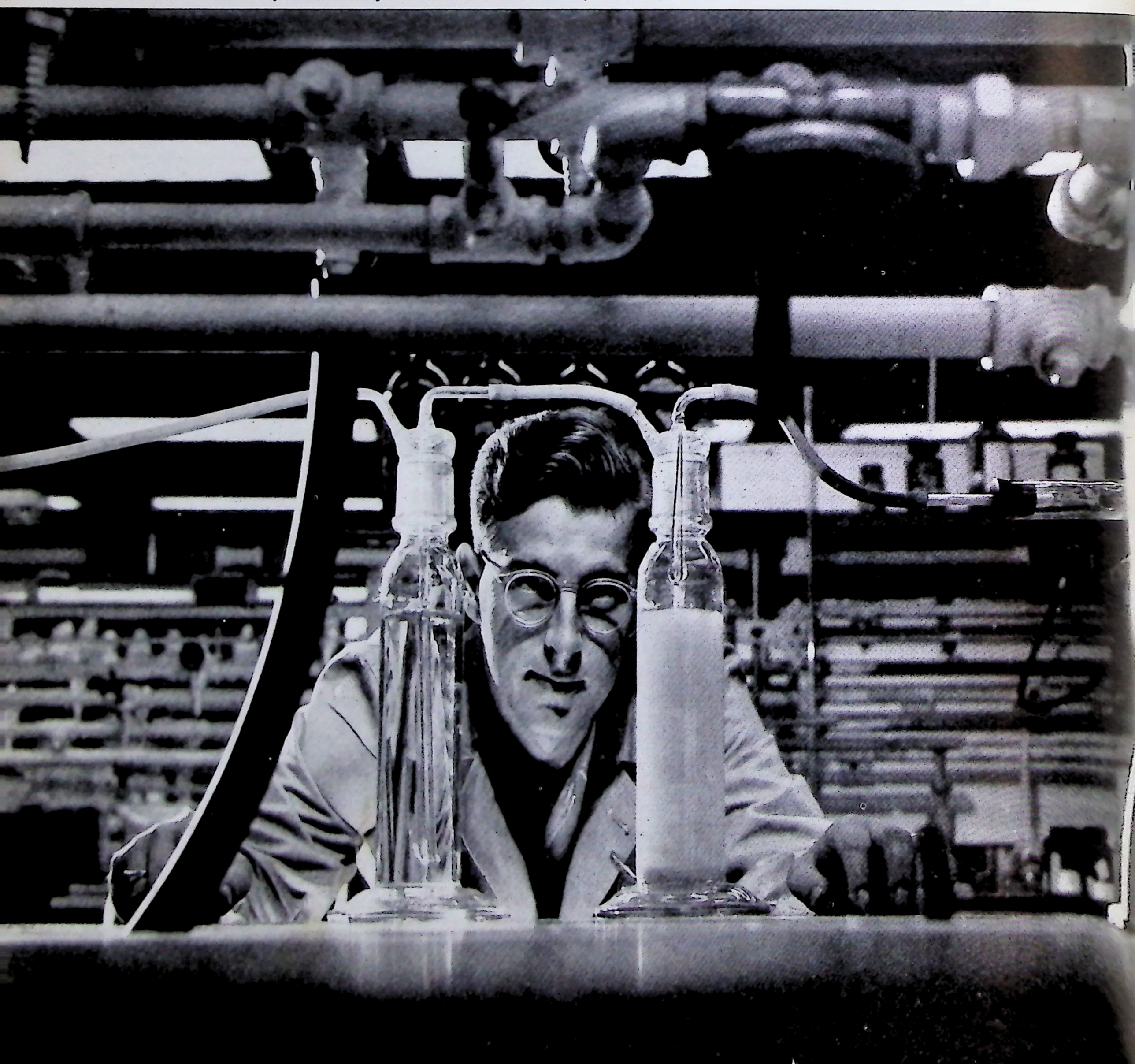
Although books are famous because people have found them good reading for many years, we all have our favorites. When eleven important authors were asked what they would buy first for their own libraries (if they did not already have them), there were very few titles they all agreed on. Most of them did want the Bible and Homer and Shakespeare. That is not surprising, for the Bible and Homer and Shakespeare tell man almost everything there is to know about himself—the good and the evil he is capable of—and the ways his spirit can triumph over disasters. Some of the other favorites among these authors were *Robinson Crusoe*, *Pickwick Papers*, *Alice in Wonderland*, *Huckleberry Finn* and *Moby Dick*, which shows that good books are not written for any one age but for all ages. In fact, one of the pleasures of reading famous books is that parents and grandparents and children can read and enjoy them together. It is an interesting fact that people who like the same books feel a special kinship.

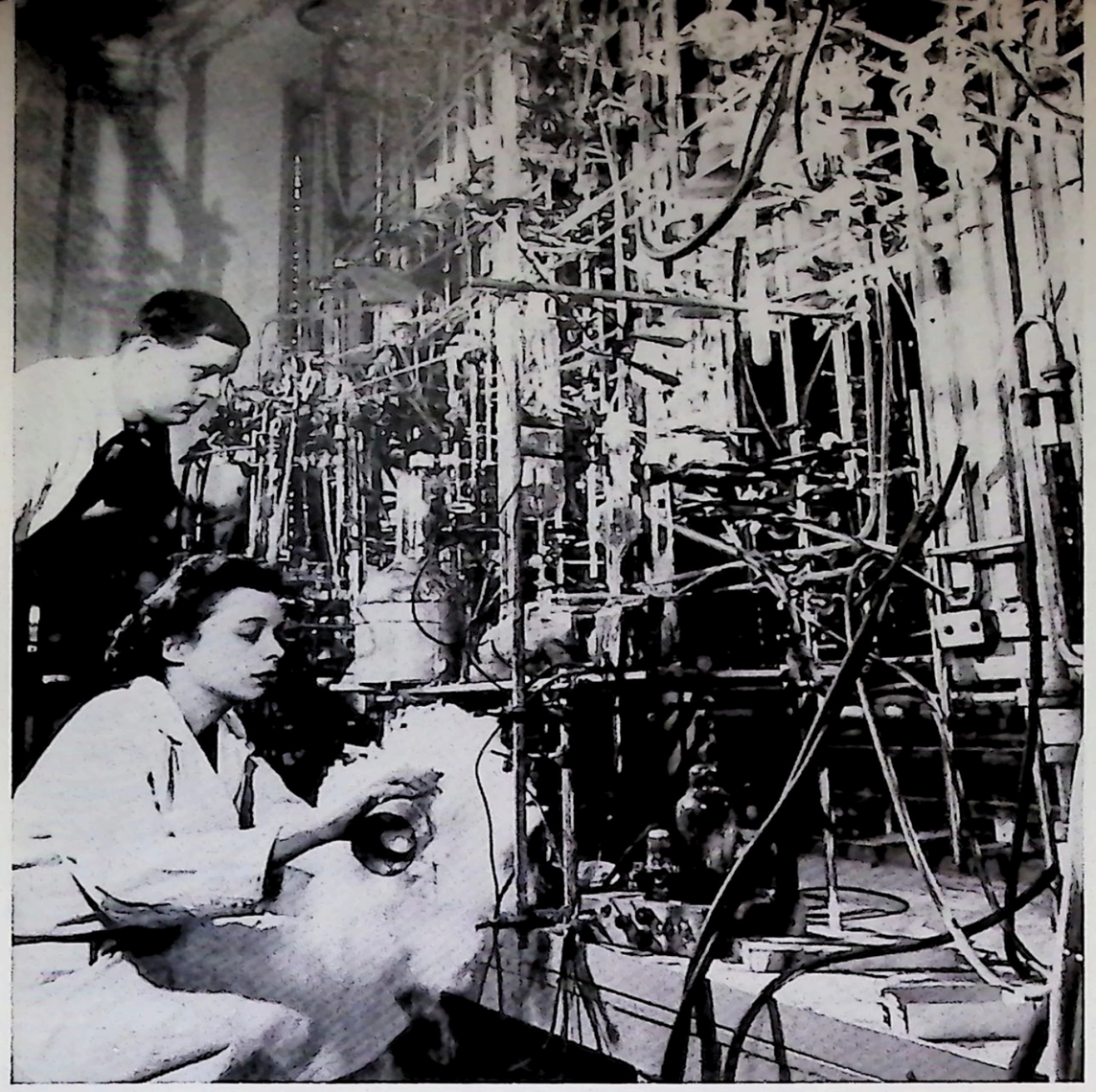
People who make friends with the classics always find new pleasures in them. That is why the authors mentioned above, who probably read all these books when they were young, still want them for their libraries. They know that such books never fail one, as people sometimes do when one needs their companionship most; the great books always are ready to give delight and comfort.

Trees growing in a forest struggle for sun as long as they live. Great books are to the life of the mind and the heart what the sun is to trees. Man must never give up trying to reach the light they have to give. Without this light he lives in darkness. ♦

CHEMISTRY IN TODAY'S WORLD

The world of tomorrow—from atomic energy to synthetic fibers—starts today in a laboratory where the chemist acts as catalyst.





Scientists probe the mysterious reaction by which gasoline is made from coal, using radioisotopes as a tracer.

from the Wisdom of The Book of Knowledge

MANY hundreds of years ago, before anything was ever known about chemistry, man was feeding, clothing and sheltering himself as best he could with what nature provided at hand. Inquisitive, observant and always dissatisfied, he gradually learned to modify and change the materials provided by nature to suit his needs better. Out of countless years of experience, oftentimes aided by chance, the ancient arts of producing wines from fruit juices, of dyeing cloth, and of tanning animal skins developed and flourished. Still nothing was known of such chemical substances as alcohol (in wine) and tannic acid (in tanning). It has been only within the last few hundred years that the chemical nature of matter and chemical changes began to be understood. Then man began deliberately to make and change materials to make them longer lasting, more beautiful and more useful. Our knowledge and our use of chemistry have spread rapidly within this short time. It is often said that today is the Age of Chemistry.

Chemicals are the basic substances from which we produce fertilizers, many metals, plastics, resins, soap, glass, gasolines, medicinal compounds, insect-killers, synthetic fabrics and many other items. They are simple substances—acids, bases and salts for the most part. Nitric acid; sulfuric acid; quicklime, or calcium oxide; ammonia; and sodium carbonate, or soda ash, are important chemicals that must be made cheaply and in tremendous quantities.

Man depends upon the green plants for food for himself and his livestock. In turn, the green plants get food from the nitrates in the soil. Continued replanting from year to year soon removes these nitrates, and the farmer finds it necessary to replace this loss by adding nitrate fertilizer. For many years our only supply of sodium nitrate was the vast deposits in the South American country of Chile. But sodium nitrate is also needed for other things. It is heated with sulfuric acid to produce the nitric acid required to make all high explosives; and man has had to use these high explosives all too frequently in modern warfare. Toluene, a harmless liquid hydrocarbon obtained from coal tar, is mixed with nitric and sulfuric acids to make the dangerous high explosive TNT. Cellulose, carbohydrate of which cotton is an almost pure form, is transformed by nitric acid into nitrocellulose. From this come dynamite and a host of other modern products.

The natural deposits of nitrates cannot supply all that are needed. So again chemistry comes to our aid. In the early 1900's two German chemists discovered that ammonia (NH_3) could be made cheaply by combining nitrogen from the air with hydrogen obtained from gaseous water, or steam. The ammonia obtained in this way could then be oxidized to nitric acid, which could be used as such or converted into nitrates for fertilizers. Today almost unlimited quantities of ammonia, nitric acid and nitrates are produced in this way.

The more civilized man becomes, the more soap he uses. Soap is formed when fats are boiled with an alkali. Sodium hydroxide (NaOH) is a common alkali. It is cheaply produced by passing an electric current through salt water. At first animal fats were used in making soap, but soon there was not enough to make all the soap and soap products that people needed. Man turned to chemistry for a new source of fats. He soon discovered that vegetable oils, especially cottonseed oil, could be hardened to a fat by passing hydrogen through them in the presence of a small quantity of a metallic element, nickel. These hardened vegetable oils are also used for shortening, replacing lard. Soaps are frequently made more attractive by coloring them with suitable pigments. They are also often scented with perfume, either natural or synthetic. For many purposes medicinal compounds are added to soap.

Whenever fats are converted to soaps, a chemical substance known as glycerin is always obtained along with the soap. Glycerin is transformed by nitric acid into another dangerous explosive, nitroglycerin. Glycerin is also of value as a sweetening agent and as a skin softener in many cosmetics.

The ordinary bottle or window variety of glass is made by fusing a mixture of sand (SiO_2), sodium carbonate (Na_2CO_3) and lime (CaO). By adding other chemical substances to this mixture, different kinds of glass are obtained. Pyrex glass, famous because it will not break when heated, is made by adding compounds of boron and aluminum. It is used to make cooking utensils. Many houses and office buildings are now constructed in part from glass brick. The lenses of eyeglasses, microscopes, telescopes and many other delicate instruments used by man in seeking out nature's secrets are made from another kind of glass called optical glass. By the addition of very small amounts of certain chemicals, generally a metallic compound, glass of almost any desired color can be obtained. When hot, glass can be "spun" into the finest of thread, and woven into cloth.

Metals are rarely found in nature in their pure form. They are almost always found in the earth as chemical compounds, or ores. The desired metals are extracted from the ores by a combination of chemical changes known as smelting. Oxides—compounds of metals with oxygen—are very important ores. Compounds easily transformed into oxides by roasting are also important ores. Metals can be set free from the oxygen in the compound by heating them with carbon in the form of coke or anthracite coal. The oxygen leaves one partnership and forms another. That is, it combines with the carbon; and so the metal is free. Impurities present in the ore are removed by addition of a "flux," generally limestone ($CaCO_3$). The flux combines with the impurities, forming a liquid—slag—which floats on the surface of the molten metal and can be easily removed. These operations are carried out in huge furnaces, or smelters, which vary in construction with the type of ore used. Electricity aids in the extraction of many metals from their ores—copper, zinc, aluminum and magnesium, and others. The use of electricity in chemical processes is called electrochemistry. Electrochemistry is likewise used to purify many metals obtained by the smelting process.

Few pure metals are right for our use without some change. Some are too soft. Some are hard, but brittle. Many rapidly corrode, or rust,

if exposed to air and moisture. Man has learned how to overcome these things by combining the pure elements with one or more other elements. Such metallic compounds, called alloys, often possess remarkable properties. Steel is an alloy of iron. With carbon, manganese, chromium, nickel and other elements, iron forms different kinds of steels which are lighter, stronger and more resistant to rust than iron. Railroad cars, locomotives, and their thousands of miles of rail, tools of all sorts, knives, machine tools, farm implements, cables for elevators and suspension bridges, springs and building supports are made from suitable steels. Bronze is an alloy of copper and tin. Brass is an alloy of copper and zinc. Pewter is an alloy of tin and lead, or tin, copper and antimony, or sometimes a little silver is used in the mixture. An alloy of lead, antimony and tin makes type-metal, used to set books in type. The solder your plumber uses is an alloy of tin and lead. What we call German silver, or nickel silver, has no silver in it at all! It is an alloy of copper, zinc and nickel. Monel metal, so much used for kitchen sinks and other kitchen ware, window screens, propellers of ships and other devices, is an alloy of several elements—nickel, copper, iron manganese, carbon and silicon, carefully mixed in exact proportions. Other alloys—made-to-order metals—are low-melting alloys for electrical fuses and automatic fire extinguishers, and so on. Alloys of aluminum and magnesium are of special importance. They are amazingly light and yet very hard and very strong. They have replaced steel in airplane motors and other parts. The gleaming, silver-bright streamlined trains which travel through the country at record speed are constructed largely of these alloys.

The coke required for smelting ores is produced by heating soft, or bituminous, coal in specially designed ovens. An oily liquid called coal tar is always obtained along with an inflammable gas called artificial, or illuminating, gas. By chemical treatment, benzene, toluene, phenol and other organic compounds are obtained from this tar. These simple compounds are now also obtained from petroleum and other sources. From them are made thousands of useful products—dyes, perfumes, medicines, explosives, synthetic rubber, plastics. Dyes were formerly obtained from plants and animals. Tyrian, or royal purple, was obtained from a tiny Mediterranean shellfish gathered by daring Phoenician sailors. Madder root furnished the dye for the bright red uniforms of the British soldiers, the "red coats." Indigo was extracted from the indigo plant. These colors and thousands of others of every imaginable tint and shade can now be made from coal tar.

Synthetic plastics, or resins, are produced by an interesting type of chemical reaction called polymerization. Molecules of one or more substances, hundreds of them, unite with one another in definite patterns to form super-molecules of a new substance, called a polymer. The process can be likened to a group of people forming one long line or closed circle by clasping hands. Plastics are polymers and are of a variety of types. Their properties are as varied and unpredictable as those of the alloys. Some are strong and tough, resembling the metals, while others are as clear as glass and even possess optical properties. Bakelite is a plastic made from phenol and formaldehyde. It is a poor conductor of heat and electricity, and is used for insulating materials, for handles on cooking utensils, handbags, brushes, buttons and bottle caps, for telephone receivers and radio parts. Lucite and Plexiglas are crystal-clear plastics from which "non-breakable glass" for airplanes and automobiles is made. Rods made from these plastics, unlike ordinary glass rods, will transmit or conduct light from a hidden source even when bent or curved. They are used to produce unusual lighting effects and to make medical and dental lamps. Nylon is one of several plastics which can be spun into fine threads and woven into fabrics. The nylon stockings so highly prized by women are made this way. Nylon material is easily waterproofed; so raincoats are made of nylon. It is also used to make bristles for brushes. This man-made fiber is created from coal, air and water. Waterproof and moldproof window and shower curtains are now made from plastic materials.

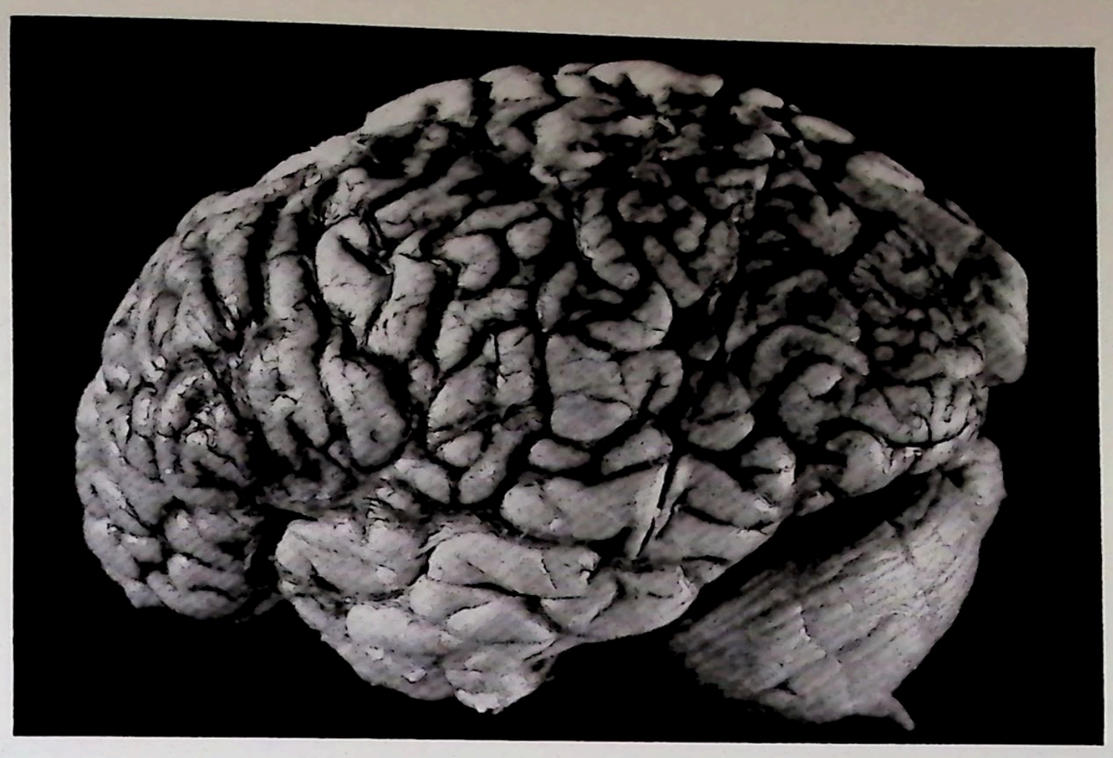
Synthetic rubber is a plastic with rubber-like properties made from substances—styrene and butadiene—obtained from coal and petroleum. Synthetic and natural rubbers are complex hydrocarbons. Natural rubber is one of nature's plastics, or polymers, and is obtained from the "milk" (latex) of certain trees and shrubs. To make it stronger, tougher and more heat resistant, it is heated with small amounts of sulfur. This process is called vulcanization. Rubber is used to make tires, boots, shoes, coats, elastic material for use in garments, and hard-rubber items of all types. For some purposes synthetic rubber is better than natural rubber, but it will be some time before it can be produced as cheaply as natural rubber.

Petroleum is found in the earth as a brown to black viscous oil. From it chemistry has enabled man to reap enormous riches in gasoline, kerosene, lubricating and fuel oils, vaseline, paraffin wax and hundreds of other valuable products. Petroleum is a mixture of simple and complex hydrocarbons. Naphtha, gasoline, kerosene and lubricating oils are separated from this mixture by a process called distillation. Then they are further purified, or refined, by chemical treatment. In the days before the automobile, before electric lighting and electric heating, kerosene was the most valuable petroleum product. Lamps that burned kerosene were used for lighting. Kerosene stoves (called oil stoves) were used for cooking and, to some extent, for heating. The gasoline was considered practically worthless. Today the demand is for more and more gasoline for automobiles and airplanes. The hydrocarbon molecules of gasoline are rather short while those in kerosene are two, three and four times as long. When heated to a high temperature the long molecules in kerosene are broken up into the smaller molecules found in gasoline. By this "cracking" process, gasoline is now made from surplus kerosene. The so-called high-octane or 100-octane gasoline used in airplanes is made by blending specially prepared chemicals with ordinary gasoline. Chemists are now experimenting with coal and natural gas to produce more high-grade gasoline.

Carbohydrates—sugars and starches—are familiar foods. Man can not live without them. Sugar is obtained from cane and beets, while starch is obtained chiefly from corn, potatoes and wheat. Chemistry plays an important part in extracting these substances from plants and preparing them for use as foods. Carbohydrates are also important raw materials from which alcohol, synthetic rubber and rayon, paper, adhesives and explosives are produced. Fermentation converts the starch present in grains and potatoes into alcohol. Large quantities of alcoholic beverages are produced in this way. Still larger quantities of alcohol are used for better purposes. Grain alcohol is an antiseptic. That is, it kills germs. Many medicines contain some alcohol. Air and water convert grain alcohol into vinegar or acetic acid. From alcohol and other fermentation products many useful substances are made. Synthetic rubber can be produced from carbohydrates as easily as from petroleum.

Cellulose is the carbohydrate which forms the bulk of most plants, especially the stalks and stems. It has no food value for man, but other animals thrive on it. Cotton is a form of cellulose. Man not only depends on carbohydrates for food, but for clothing as well. Cotton, wood, cornstalks and other cellulose materials are used to make paper, rayons and cellophane and many other products. In one process for making paper, pine logs are shredded by powerful machines and then boiled with a chemical called calcium bisulfite. This treatment removes impurities. The pulpy mass of pure cellulose fibers that remains is rolled into thin sheets, dried and further treated to produce the paper. To make artificial silk, cotton and other cellulose materials are made into liquid substances by chemical treatment. When these liquids are sprayed through fine nozzles into the proper chemical baths, the cellulose comes out as long lustrous threads resembling silk. Rayon garments are woven from these threads. If the liquid cellulose is forced through long fine slots, the cellulose is obtained in thin transparent sheets called cellophane.

We cannot let the curtain fall on this drama of chemistry in the world of today without a glance at the world of tomorrow. With the discovery first of radioactive elements, and then neutrons, protons and electrons as the building units for the atom, it soon became apparent that a way existed for changing one element into another. Huge machines called cyclotrons were built to study the possibilities, and from their use man received an inkling of the unbelievably enormous quantities of energy locked up in the tiny atom. The key to this lock, the key to atomic energy, has been discovered. Mankind is looking forward with anxiety and awe to the new era which we are about to enter. ♦



THE BRAIN

DOES ITS SIZE OR STRUCTURE CONTROL INTELLIGENCE?

CAN IT EVER GET FILLED UP?

from the Wisdom of The Book of Knowledge

CAN a brain become so filled with knowledge that it can remember no more? Can it be so full that new facts can not be packed into it without displacing old ones? This question, no matter how we word it, seems to assume that the brain is the same thing as the mind.

That is not true. The brain itself is a complex organ, made of tissue just as the rest of the body is. The brain controls bodily movements, and it is also concerned with the senses—seeing, smelling, touching, hearing and tasting. All the knowledge that we have first comes to us through these pathways. The mind, however, is not a physical thing; it can be neither seen nor weighed. It is the part of each human being with which he remembers and thinks, feels love or hate, joy or grief. Nevertheless, it is through the brain that the mind works, and we could not have a mind unless we first had a brain to gather up all the sense impressions. At the same time, we know that no activity of the mind takes place without activity somewhere in the cells and fibers of the brain and nervous system.

Every time that we remember a fact, an idea or anything else, a deeper track is worn along the same passage in nerves and brain that was affected by the original impression of the fact or idea. Perhaps this is best understood by thinking of a telephone message—a long-distance one, needing several connections. The difference is that when we remember we are, consciously or unconsciously, getting a series of connections that we got once (or many times) in the past.

Unless the brain becomes diseased or tired from overwork or age, it can go on making these connections, and repeating them. In general, the more we exercise our memories the better they are. Some people, to be sure, remember more clearly and more easily than others. Some people remember sounds especially well, others remember sights, others remember words or people or numbers.

No, a brain doesn't get filled up any more than a telephone wire gets filled up with messages at the end of a busy day. ♦

NATURE'S ANIMAL KINGDOM

from the Wisdom of The Book of Knowledge

Wilderness creatures don't pose for their portraits, nor can they be directed, nor do they use a script. The telescopic lens is a necessity in filming the cautious, shy, dangerous, fear-haunted animals such as the Ringtailed Cat. — WALT DISNEY

Native wildlife, to me, is part of the American land and scene. It is closely associated with our history and traditions. To observe our wild creatures in their natural habitat, I regard as a privilege of the American citizen. We are entitled, by common consent, to experience the delights, the beauties and wonders of living creation in the world around us — just as we have asserted a common right to visit woodland, mountain, desert and seashore areas in national parks and monuments. We claim these privileges for our children as well as for the present generation.—WALT DISNEY

EVERYTHING that lives in the water, in and on the ground and in the air is very busy signaling and receiving signals about three subjects —danger, food and self. Information on these matters is essential to life. One must recognize the shape, smell and sound of danger so as to hide, run or be ready to fight.

At the same time all members of the animal kingdom must be alert to find food, the news of which is spread by odor, sight and sound. Crows and vultures gather from far and near when a carcass is found. Unlike animals such as coyotes, and dogs, which find food by odor, those birds find it by sight and sound. Kiwis and bobwhite quail, which poke around on the ground for their food, are the only birds that use odor for their signals. The vultures and crows search the ground with keen eyes, and when one spots the carcass he gives a loud squawk and dives. Others note the downward movement of their fellows on the horizon and fly to investigate.

Just as important as these signals are those about oneself. Creatures must have signals to find others of the same kind. They must find mates to reproduce themselves at certain times. They must identify themselves so as to live in groups. Living in herds, flocks, schools, swarms and packs is a law of nature. That is the way that little things give themselves the power of bigger things. They have more lookouts. They have a greater chance to find food. The world is very big to the very little. To keep from getting lost, individuals must have a fine set of signals.

One of the barriers to understanding animal signals is that we are apt to think of them in human terms. Animals do talk to each other, but not in words. Words, especially when they are put together in sentences, are intellectual communication. They take a certain kind of brain, and only humans can talk that way. When a parrot is trained to say "hello," it is just mimicry, not bird speech.

No one ever succeeded in teaching a bird or any other animal to say "food" when it is hungry and "water" when it is thirsty. Even the most intelligent of animals, such as dogs, horses and monkeys, cannot be taught to speak a word of our language to express a need or convey an idea. One may be taught only to recognize a few words spoken to it. That is because animal language is instinctive. The creature can be trained to connect an action with a sound or expression.

Just mention the word "walk" to a well-trained dog who is tired of hanging around in the house and see what happens. His reply is in pure dog—a bounce to the door, a wag of the tail, and a happy bark. Rowena Faure made a vocabulary for a seal that lived with her for four years. The seal would respond with the right kind of action to thirty-five different words. They were not the seal's words, they were hers. The seal did not talk with them. Through long repetition he was trained to connect a certain sound with a certain action.

Animals are very sensitive to sound, whether a word, a clap of the hands, or the crack of a whip. They are also sensitive to odors and quick gestures and expressions of the mouth and eyes. These are the means by which they communicate with each other in wild nature.

An important break-through into the mysteries of animal signals came in 1949. That year Karl von Frisch announced his translations of the language of bees after thirty-five years of experiments. Von Frisch had proof that these exciting insects actually talk to each other—not with words but with motions and odors. A bee that has been scouting around the countryside returns to the hive with a full and accurate report as to where the best flowers for plundering are to be found on that day. The scout gives clear directions to the other members of its hive for compass direction, distance, kind of flower, and abundance of pollen and nectar.

When a scouting bee returns to the hive, the others, who have been waiting impatiently, clear a place for the scout to put on a little dance. If the dance consists of circling right and left in a figure 8, the scout is saying "Plenty all around. Go get it!" One glimpse of this headline, and the bees zoom into the air, flying in ever widening circles from the hive. They only needed to know that there are good supplies of pollen or nectar somewhere farther than a hundred yards from the hive.

If the scout had to go far before finding flowers freshly open, the report must be longer and more detailed. In this case the dancing bee runs forward on a straight line which points the direction. As it goes it wriggles the abdomen vigorously if there is plenty of nectar for all

The Koala, or native bear, lives in the eucalyptus forests of Australia. He is as lovable and harmless as a teddy bear and just as dear to children with his soft brown eyes, snub nose and soft woolly fur.

The great book of nature opens and the secret pages are on view, and as the facts of wildlife unfold, outstanding maternal devotion is revealed as shown here by the oppossum carrying her baby.—WALT DISNEY

The activities and survival impulses of wild creatures make them seem much like man. The Emperor Penguins strut on their island of ice wearing nature-made tuxedos.

comers. It wriggles its abdomen slowly and halfheartedly if the supply is scanty and only a few should go get it. The straight line is only an inch or so in length, and the bee keeps circling back to the starting point. If it hurries around, the flowers are close. If it moves slowly, the flowers are far away. The pace of the dance tells the distance in flying time. For example, 9 circles in 15 seconds says that the goal is about 330 feet away. Two circles in 15 seconds says that they must go 3 7/10 miles. This is real conversation! The scout gives each bee a speck of pollen or a droplet of nectar from the kind of flower that has the most to offer. This is a sample of odor which the bees take along to match with the flowers.

This work of von Frisch shows that marvelous discoveries await the explorer in the field of animal signals. Many signals are more familiar and understandable than the language of the bees. Among the most popular are the calls and songs of birds. Because these are so much heard and are often musical, we usually only half hear them, treating them like pleasant background music of the outdoors. We do not listen closely and try to understand what the birds are saying. Bird songs are as vivid and exciting as bird flight, yet as bird language they are one of the least studied parts of animal life.

The meaning of some bird-sound signals is perfectly clear. The clucking of a hen in the barnyard is a reply to the peeping of her chickens. They are keeping track of each other while wandering around picking up seeds. This is a cheerful example of a constant conversation between mother and children which holds the flock together. The clucking and peeping has a comfortable rhythm and pitch until danger threatens. Then it suddenly becomes loud squawking by the hen and high-pitched squealing by the chickens.

A mated pair of birds with a nest of eggs or young to take care of, talk back and forth to keep in touch with each other. Some of the calls are signals that they are ready to change places. Phoebes speak a very pretty bird word at such a time—"phoebe!" But if the lookout, swaying on the top of a red cedar, catches sight of a suspicious movement, the reassuring spoken word breaks off. There is ominous silence that says "shh!" while signals are given with silent tail flipping.

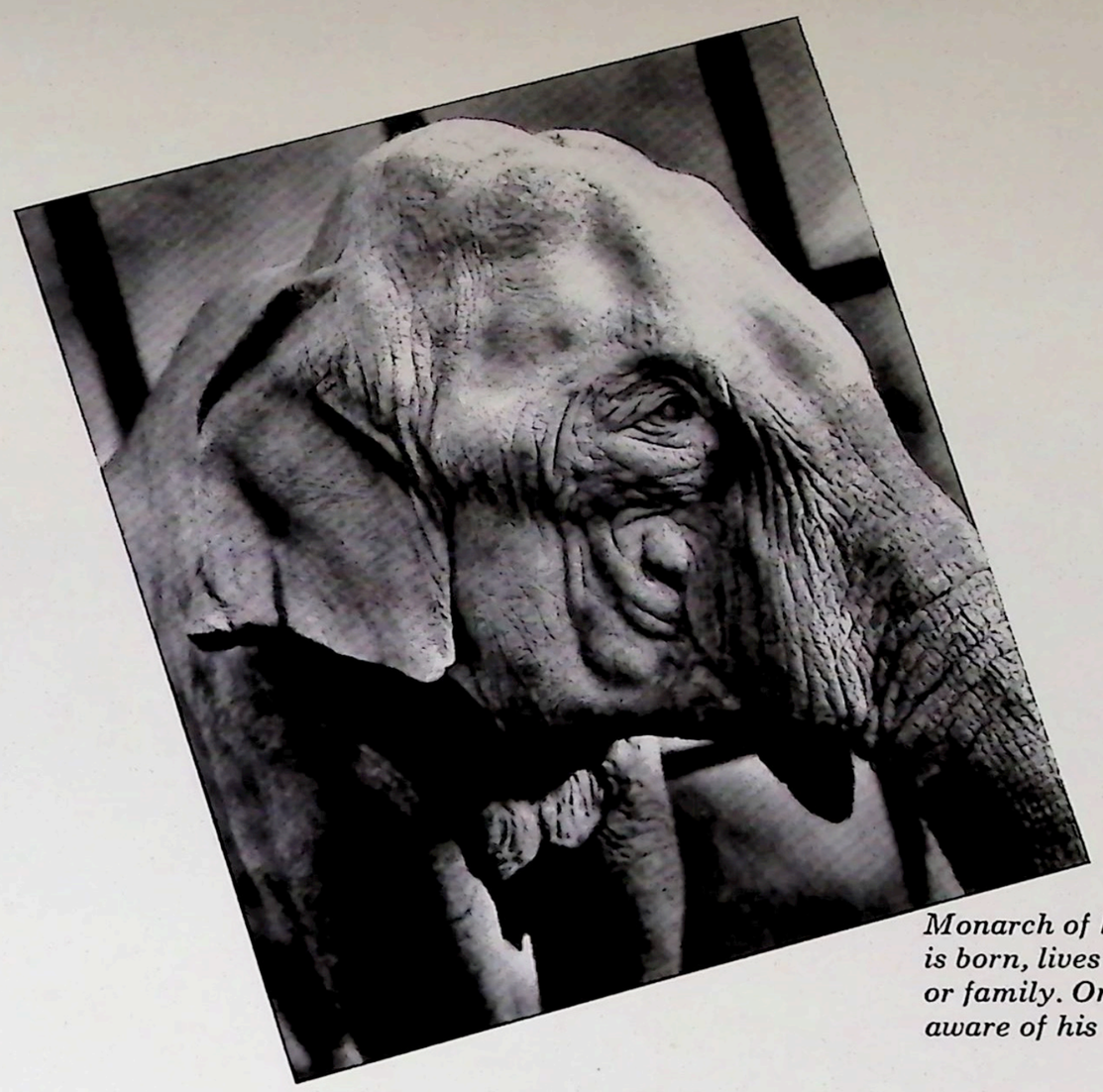
Bats have a thrilling signal. They live in dark caves and fly in the darkness of night so they cannot use keen eyes the way birds do. Yet they keep in touch with each other, find their way back to the home cave and do not collide with things while flying fast in the dark. An Italian scientist named Lazzaro Spallanzani hung a forest of strings from the ceiling, far enough apart so that a bat with outstretched wings could fly between them. He attached a bell to the end of each string. Then he let the bats free in the room in pitch darkness. He could hear the whir of their wings and feel the wind from their swift-passing bodies —but a bell rang, faintly, only twice.

That was in 1794, and not until 1920 was the great mystery of bat signals explained. Bats use sonar which sends out sound vibrations higher than the human ear can hear. Above 20,000 vibrations per second, sounds become supersonic. Bats use 50,000 vibrations per second. These are poured out of the bat's mouth in short bursts of 100 waves each. If you could hear it this would sound like a very high, quick buzz. The echo bounces back into the bat's tall, sharp ears. Thus he keeps signaling to his fellow bats, and also measures the distance and the size of an object so as to fly around it without slowing speed.

Many mysteries are waiting to be solved. Elephants talk to each other by low muttering and rumblings when they are in a huddle. But how do elephants communicate with other members of a herd across more than a hundred miles? By telepathy? Moths are able to call each other across two miles at least. A female gypsy moth in a cage was hung from a pine tree on windswept Cape Cod. The male, released two miles away, went to her as straight as a moth can fly. When they are in the same vicinity the moth signal is odor, but what was this? Radar? There is a hint that it is. The lengths of the segments of the gypsy moth's feathery antennae match the lengths of the infrared waves.

The world around us is filled with waves and forces and sounds and movements that are signals of wild nature. Rattlesnake rattles and firefly flashes, wapiti elk bugling and beaver slapping, the flashing rosettes of the pronghorn antelope and drumming of the grouse—everywhere animal signals tell an exciting chapter in the story of life. ♦

In nature's balance—in her whole living ferment of passions, strivings, adjustments—everything has its place. The newborn colt wobbles to the warmth of its waiting mother.
—WALT DISNEY

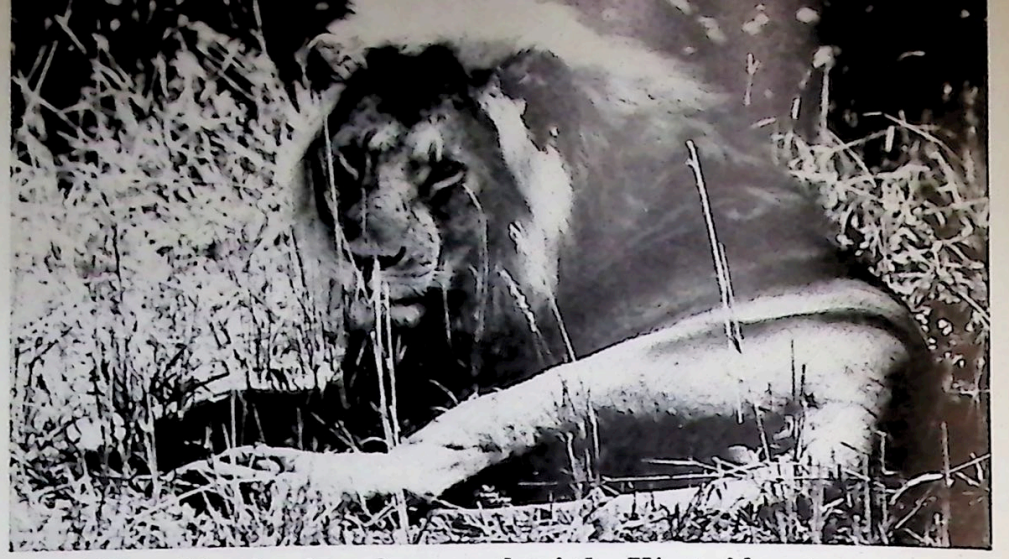


Monarch of his fascinating world, the elephant is born, lives and dies as part of a large herd, or family. Only when danger threatens is he aware of his strength.

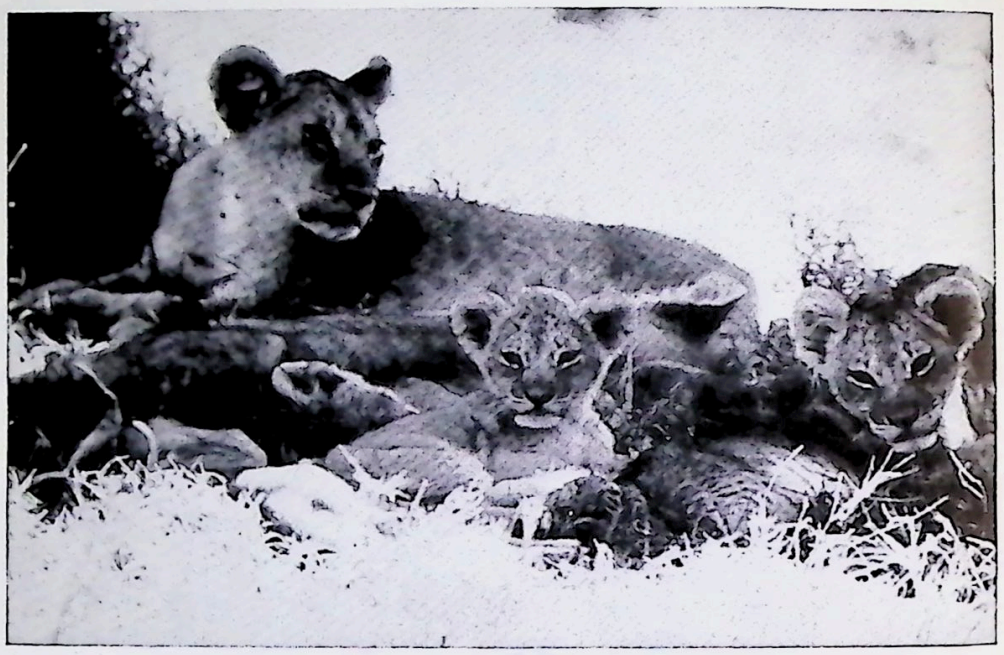
The theatre's star system could have been copied from the seal who always responds to applause. He swims, plays, eats and performs for the pleasure of the crowd.

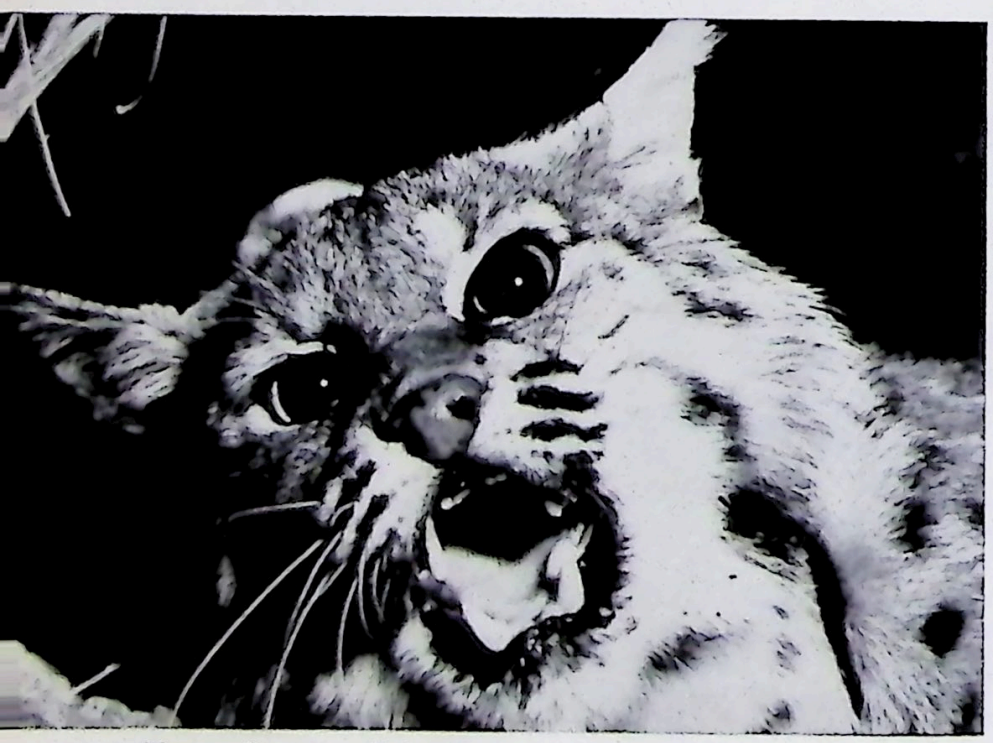
The big powerful grizzly bear is wiser and more cunning than most of his forest friends. Considered nature's clown, the papa bear is resourceful and individualistic.—WALT DISNEY

The giraffe is built to nibble on the high trees of the central African plain. So long-necked and long-legged, he must kneel as if in prayer to drink water.



The African Lion is a homely example of the King of beasts. Leonine mothers (below) are devoted to their cubs, considered the spoiled children of the African wilds.





Nature becomes living drama in the angry beauty of a young female bobcat, or lynx. Like all the cat breed, the bars on her tongue slant backward in rough texture.

Emerging from the nest at the base of a tree, the marten mother displays her hunting technique. In the natural world, there is no such thing as juvenile delinquency; animals learn their lessons well.

Nature casts her characters to type; traits of a species are fixed for ages. A baby sea lion, shy, timid, wary, always behaves more or less like all others of his breed.
—WALT DISNEY

The delicate, graceful fawn surprised in his natural habitat by the camera. Animals are prompted by instinct, by elemental urges, not by man.—WALT DISNEY

The showshoe hare

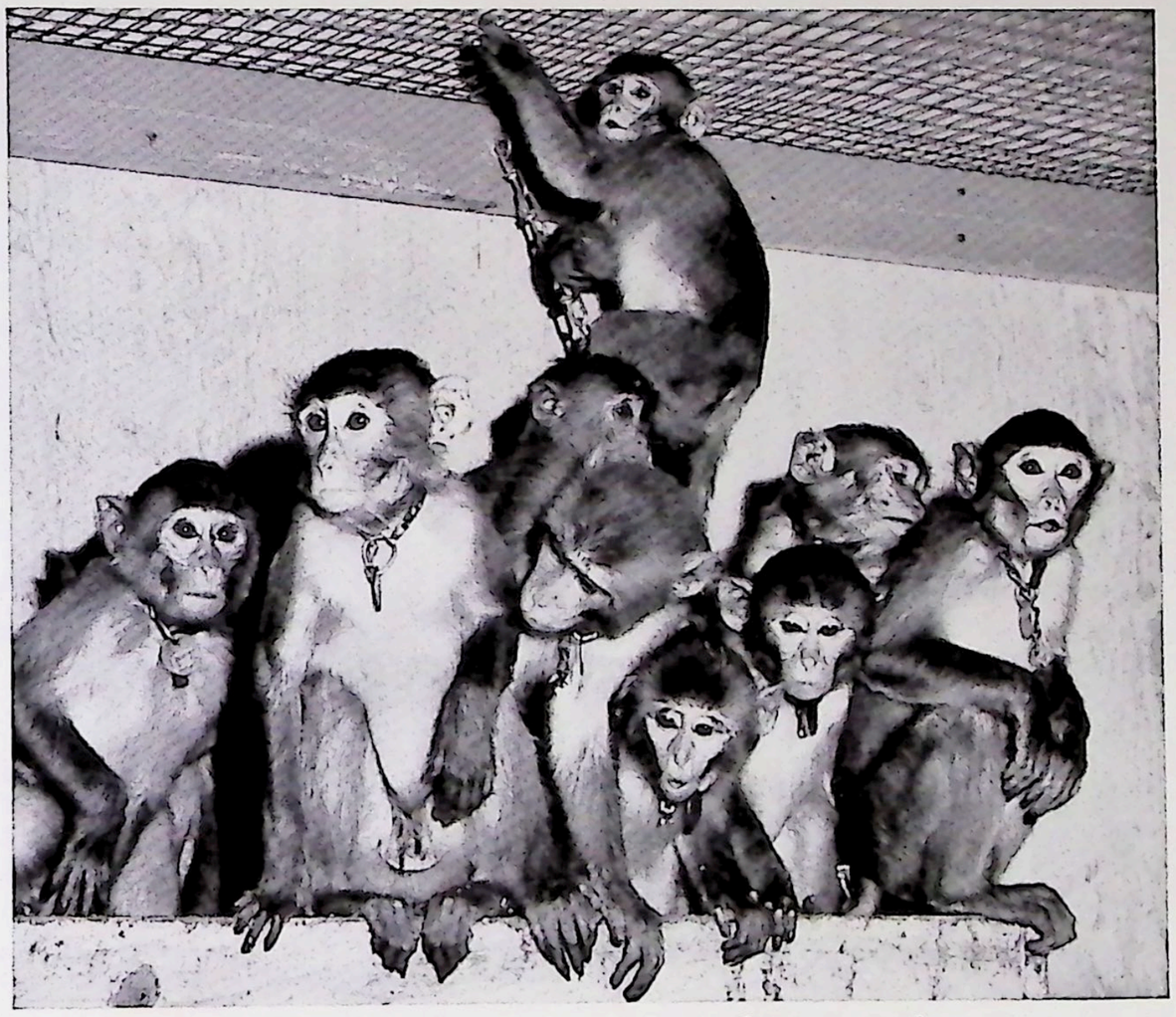
Wild animals are very respectable; raw living nature has more basic love than hate. Squirrels show affection just as man does (left); and (right) play in the sun while they search for food.

A mother kangaroo carrying her young one in her pouch, uses her tail for support in standing or walking and her forelegs for balance, not progression.

Domestic animals are as interesting to watch as their wilder cousins.
These puppies are especially dear to the hearts of young boys and girls.

These delightful kittens, of the family of Felidae, are a far cry from their violent cousins, the lion, tiger, leopard, puma.

Nature takes care of her own by providing convenient water holes at the edge of the jungle where zebras and other animals can quench their thirst.

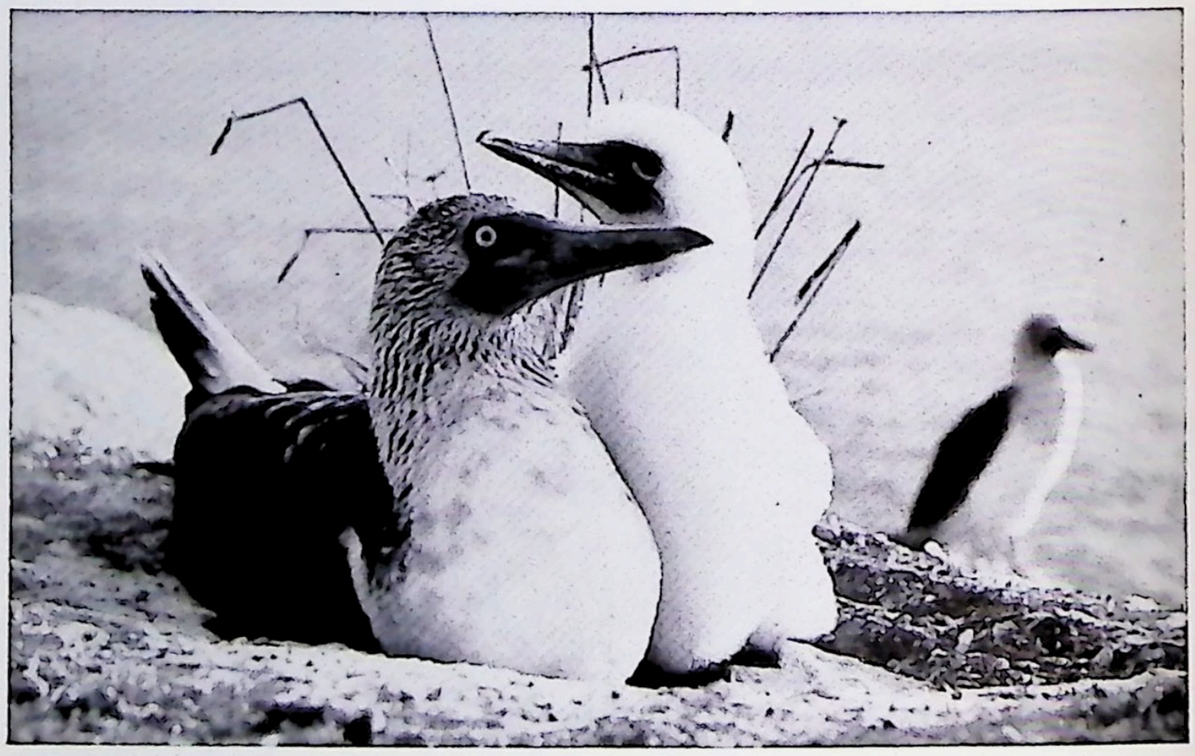


Most understandable to humans are the monkeys who seem to share man's standards and instincts. They are examples of nature's playful moods and surprising comicalities. — WALT DISNEY

The lithe impala, a species of antelope native to the African plains country, can jump 30 feet or more in one soaring bound to escape the charge of his natural enemy, the lion.

Mother bird feeding her young. Long before the stone-age birds invented the gift—simple offerings of sticks and pretty stones.

Newly-hatched baby chick, facing a complex world for the first time. He will be taught the ways of the bird-world by his mother.



Booby birds, inhabitants of the Galapagos Islands, lay their eggs in a simple nest of twigs on the ground. They are expert aerialists.

An eagle perched on the limb of a windswept tree on the rim of Grand Canyon. Soaring above the majestic beauty of his natural wonderland, he will dip abruptly when he spies food.

Layson albatross spend most of their lives flying over vast areas of open ocean. Airborne, they are graceful; on the ground their antics are so grotesque they are commonly known as "goonies."

Owls caught in an unguarded moment. To observe wild creatures in their natural habitat is a privilege of the American people. —WALT DISNEY

Whenever the prairie falcon soars through the sky, the tiny earthbound creatures of the plains must be on guard. The facts of wildlife unfold in fascinating, often astonishing ways.

—WALT DISNEY

THE PRAIRIE DOG

Nature's Most Sociable Creature

from the Wisdom of The Book of Knowledge

In the days of not so long ago, the wide West of America was not as it is today. Then the West was sparsely settled. There were no vast fields of wheat and corn, cultivated by tractors, with here and there cities rising high into the clear sky. But there was one kind of town that covered miles and miles of unplowed western land—the prairie-dog town.

Nowadays, even in the far West, you are lucky if you see a prairie dog. To be sure of a look at one of these frisky, friendly little animals, you must go to some zoo that contains a little town of them, such as that in Washington, D. C. For they are, above all, sociable creatures who like to live together. The homes they make are all underground, but the little citizens like to spend their time out in the sunshine, near the openings of their burrows. Here they frisk and frolic together, or stand bolt upright, keeping sharp watch for enemies.

A prairie dog isn't, of course, any kind of dog at all. It is a rodent, first cousin to the ground squirrel. There are two principal kinds, the white-tailed prairie dog and the black-tailed prairie dog, but all have chunky little bodies, blunt, inquisitive, bright-eyed faces, and stumpy, jerky tails. They came to be called "dogs" because when alarmed they give a short, sharp bark. They also appear to talk together in squeaks and chattering, so that a prairie-dog town is a lively place.

The black-tails usually live in open, level country, while the white-tails choose to dwell in rougher ground, such as the canyons and mesas of the Rocky Mountains. Although the prairie-dog homes lie underground, it is easy to spot them because each is marked by a mound around the opening. The mound is, more exactly, a crater, with the burrow in the middle. It is likely to be about a foot high and three or four feet across, but sometimes, when it has marked a prairie-dog home for many years, it will rise even higher and be as much as eight feet across. Thus it was very easy, in the old days, for a horseman riding across the wide open plains of the West to see a prairie-dog town, marked by many, many of these mounds, long before he came near enough to see the frisky, brisk little creatures scampering "all over town."

These mounds are not merely for show. They are as necessary as dikes in country that may be flooded. They keep the water out of the burrow, so that, down below, the prairie-dog home is snug and dry whatever the weather. So the little animal carefully scrapes up the earth toward the mound with the long, sharp claws of his forepaws and then tamps it down firmly with his blunt little nose and with paw pats. Although the prairie dog carefully clears the surrounding ground of grasses and other plants that might make good cover for a lurking enemy, sometimes he leaves one tall weed growing beside his burrow. Perhaps this is so that he may be able to know his home mound from the many others around it. Or perhaps he just admires the decoration.

Now the most remarkable thing about the burrow is that it goes *straight down*, for some ten or fifteen feet. Thus when the prairie dog scoots home from some danger, he plunges downward, just like Alice going down the hole into Wonderland. How does the little creature get the earth up out of a vertical hole like that? No one seems to be ready to explain that. A little way down he makes a niche, for a listening post. Farther down, the plunge hole turns at a right angle into a tunnel. This may extend for ten and even thirty or forty feet, and out of it the animal digs little side passages and niches. The biggest of these is his round bedroom, some eight or ten inches across, which he lines with soft grasses or other comfortable plant material. Here the pups are born, from two to six in a litter.

It is usually in midsummer that the baby prairie dogs come into the world. So that when, in a few weeks, they are led up into the open, they find a fine, pretty world all about them, full of warm sunshine and plenty to eat. And how a prairie dog eats! Most of his food is vegetable, largely grasses, and he eats every bit, leaves and stems, roots and seeds. For variety, he adds a bit of insect diet, such as a few grasshoppers or beetles. It is fun to watch a prairie dog eat, because he sits up for it, just as though he had been taught to do so as a trick, and holds his food in one paw as he nibbles.

But that appetite of his has been, literally, the death of him. Once upon a time, when this big land of ours belonged to the Indians, there were more prairie dogs than we have now, but not too many. There were plenty of coyotes and wolves and other animals to keep down their numbers. Even though little Indian boys were trained to use their small bows and arrows by shooting these easy marks, there were still just about enough prairie dogs to keep what is called the balance of nature.

Then the white man came, killing off coyotes and wolves and Indians, ridding the prairie dog of his enemies. The settlers also plowed up the land and planted crops, delicious things like wheat and rye and alfalfa. How the prairie dogs took to that! They dug up the seed corn as soon as it was planted. They dug up potatoes too and nibbled at cantaloupes and gnawed the roots of the orchard trees. With danger gone and plenty of food at hand, their numbers increased enormously. There might be as many as twenty-five prairie dogs to each acre of the farmer's cropland. And every mother's pup of them nibbling and gnawing.

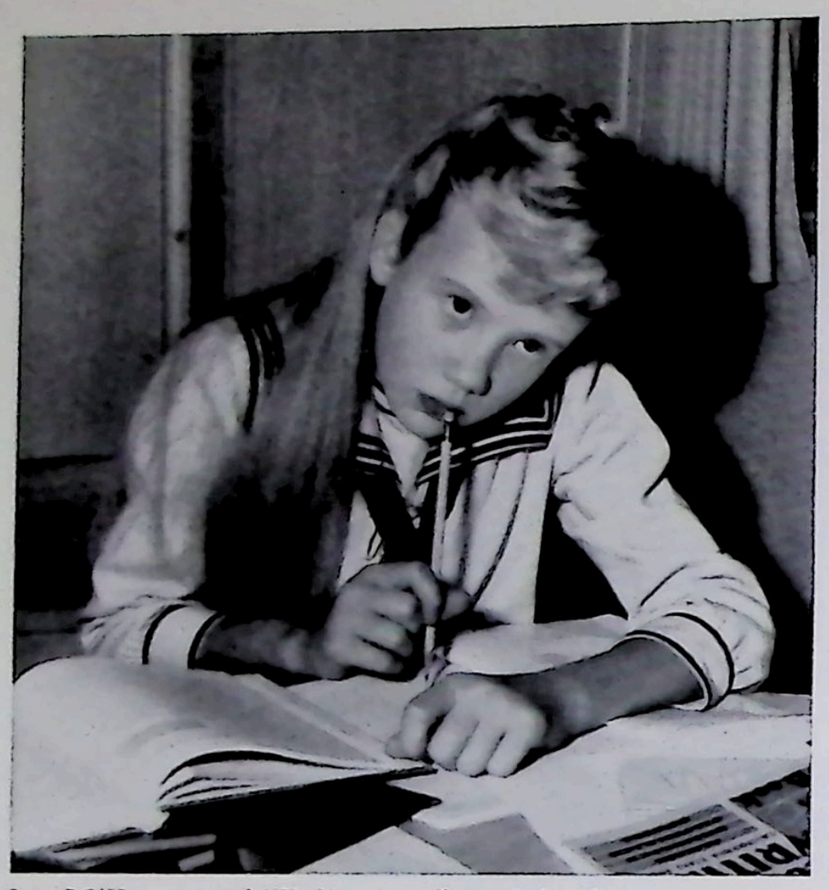
Government experts figured, in those days of plenty—and of too many prairie dogs—that 32 of these animals ate as much grass as one sheep, and 256 ate as much as one cow. So you can see why the ranchers of the West began to get angry. They didn't think the prairie dog was just funny and amusing any more. He was eating them out of house and home, as the saying goes. The losses to the hard-working men of the western range and farmlands amounted to millions of dollars a year.

So, toward the end of the last century, began a great war against the prairie dogs. Arrows and guns could make little effect on their vast population. Then government scientists of the Biological Survey, part of Uncle Sam's Department of Agriculture, came to the rancher's rescue with poison and poison gas. And the prairie-dog hordes swiftly diminished, until today they are so few they do no harm to anybody.

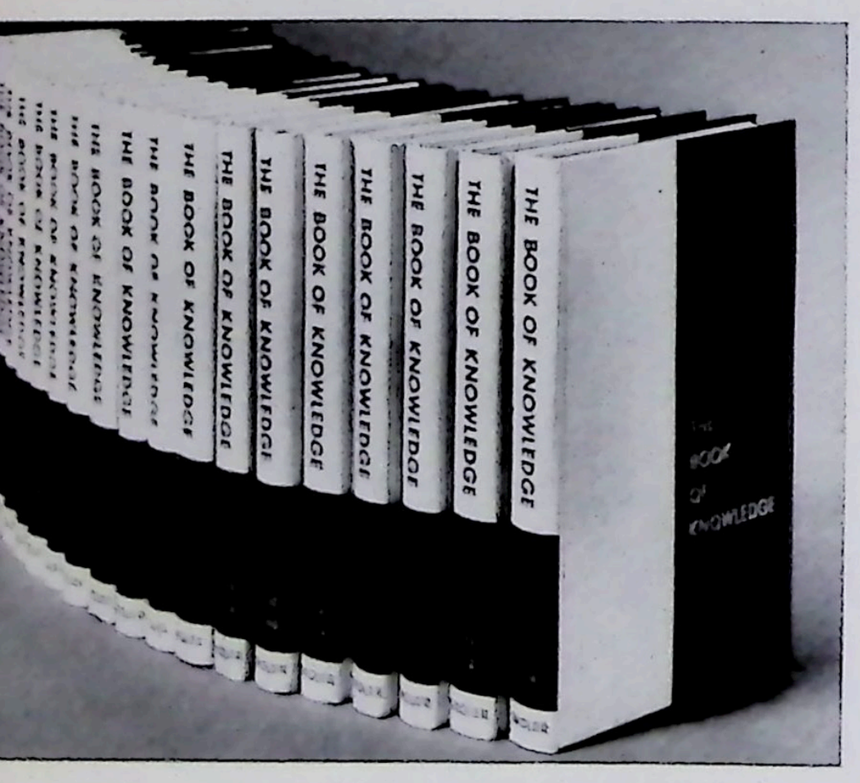
It is sad, of course, to think of those funny, lively little beasts wiped out like that, just as the buffalo had to go when the white man came in with his cattle and fences. But that is all part of the story of this country and how we turned it from a wilderness into a mighty nation. Now that we have conquered the land, from the Atlantic all the way to the Pacific, we prize what is left from the days of its unspoiled wilderness. And a small but delightful part of that is the prairie dog, still to be seen here and there in the wide spaces out West, sitting up on his hunkers, sniffing the air for danger. ♦

WONDER QUESTIONS

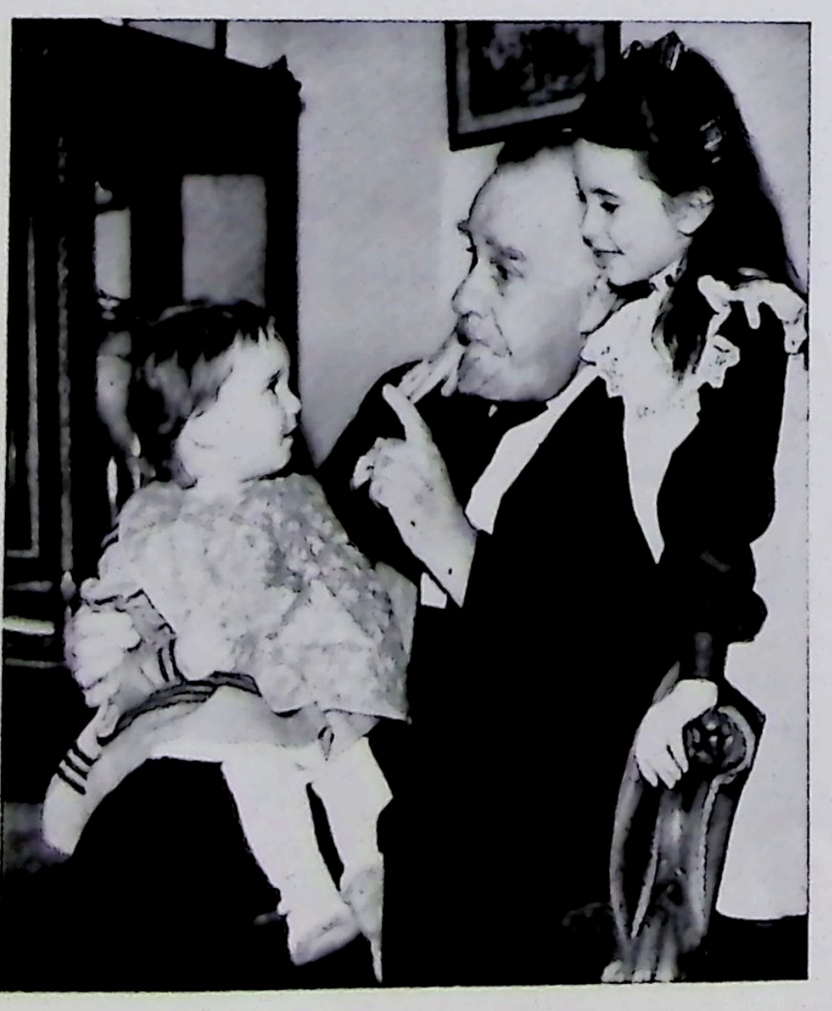
The child learns by asking questions. When he comes upon some of his questions in a reference source, he reads the answers and his sense of wonder is served—and his sense of curiosity about further information often aroused. When he turns to a new topic, his attention is caught by questions that at some time have occurred to him. There are 541 such questions strategically placed throughout THE BOOK OF KNOWLEDGE, with answers written in the language of children. Immediately adjacent is background reference material. The questions range from the early wondering inquiries of the very young child (Why do the stars shine? What makes the wind whistle?) to the analytical inquiries of the older children (How will we travel to the moon? Where does a thought come from?). And it is interesting to note how frequently the answers to the wonder questions must be revised, for they contain definite information and often reflect new knowledge. THE BOOK OF KNOWLEDGE aids the child not only in answering his questions but also in getting him to ask questions. It helps the parent and teacher not only in guiding the child to facts but, beyond that, to guiding him in understanding, and once again beyond passive understanding to active appreciation of beauty and moral values and to constructive work on practical problems.



Hayley Mills, star of "Pollyanna," studying between scenes.



Ability to answer a child's eager questions is an important function of intelligent parents.



From the eighteen great departments of The Book of Knowledge, which together cover the child's world

THE EARTH

Why is snow white? Snow is water frozen into countless crystals of beautiful shapes. One of these crystals by itself would let light go through, as a thin piece of ice does. But snow is a heap of fine crystals packed closely together and facing in all directions. Such a heap reflects the white light of the sun, or throws it back.

SCIENCE

When we see a rainbow can people see the other side? No. A rainbow is not a thing of substance, like the arch of a railroad bridge. A rainbow can appear to us only when we have our back to the sun.

ANIMAL LIFE

Can a fly hear? There are a few insects that can hear, but the greater number, including flies, cannot hear at all. Every imaginable kind of sound has been tried, and insects, with the exception of a very few kinds, take no notice of the sound whatever. Other senses of insects, including flies, are so wonderful, and in some respects so superior to our own, that it is immensely interesting to find that nearly all, including the highest insects, such as the bees, ants and wasps, are deaf.

PLANT LIFE

How did the stone get inside the cherry? The stone, or, rather the living seed inside the stone, is the important part of the cherry. This is the part that will grow into a new cherry tree if given a fair chance. The juicy part, which we eat, only helps to give the seed a fair chance. Birds prize the juicy part as much as we do. A bird picks a cherry from a tree and carries it away; it eats the soft part and drops the stone to the ground. The time comes when the seed starts swelling. Presently the hard covering splits, and the sprout shoots up, and a tiny root pushes into the earth. A new fruit tree has started to grow.

OUR OWN LIFE

What makes me hungry? When you are hungry, you have a sinking feeling in the pit of your stomach. This uncomfortable feeling is caused by the movements of the stomach. During the time when the stomach is filled with food, we do not feel discomfort unless we have eaten too much food, or the wrong kind of food. But when all the food has passed through the stomach into the intestines, the stomach begins to expand and contract, like a first opening and closing. This movement gives us the hollow feeling that tells us instinctively that the body needs more food.

FAMILIAR THINGS

Why is the fire hot? Fire gives out rays, like the rays of light that we can see. The rays from the fire, known as radiant heat, can not be seen, but we feel them and are warmed by them. It is possible to reflect these rays, just as rays of light can be reflected. Electric heaters, for instance, are so constructed that the rays of heat are reflected from a metal surface out into the room. It is believed today that matter is made up of tiny units, called molecules, which have some freedom to move. As any object becomes hotter and hotter, its molecules move faster and faster and fly apart. When we boil water, the molecules of water move so rapidly that they finally escape from the water in the form of vapor, or steam.

LITERATURE

What does encyclopedia mean? En means "in," and is added to make the word stronger; indeed, the word is often used without the *en*, and just written "cyclopedia." Then the next part of the word comes from the Greek word *Cyclos*, a circle, and tells us that the book is not about one thing only, but goes all the way round knowledge. And the last part of the word is just the English form of the Greek word *paideia*, which means teaching, or instruction, and which comes from another Greek word, *pais*, a child. So an encyclopedia is a circle of teaching.

STORIES

Was there a real Mother Goose? The nursery jingles that we know as the rimes of Mother Goose are a valuable part of our folklore. They existed hundreds of years ago but were not written down and put in a book until the 18th century when T. Fleet in Boston, in 1719, made a collection of them and published them. Now it is a strange coincidence that Mr. Fleet's mother-in-law was a Mrs. Goose, and that she brought these old rimes to the attention of the publisher by singing them to his little boy, her grandson. Many people believe that this kindly old grandmother was the original Mother Goose of the famous nursery rimes.

FAMOUS BOOKS

How many books are there in the world? Basing his conclusions on the most reliable data available in library catalogs, a librarian has estimated that the total number of titles of books published since printing was first invented is 18,000,000. Of some books, of course, only a few are printed, but of others hundreds of thousands, and, as in the case of such books as the *Bible, Pilgrim's Progress, Robinson Crusoe,* millions have been printed.

ALL COUNTRIES

What is the North Atlantic Treaty Organization? Louis St. Laurent (then External Affairs Minister of Canada), in September 1948, brought forward the idea of mutual defense among countries bordering on the North Atlantic Ocean. The outcome was a mutual-defense treaty signed in 1949 by Belgium, Canada, France, Luxembourg, the Netherlands and the United States. The treaty came into effect in 1949 and in the same year Denmark, Italy, Iceland, Norway and Portugal joined; and in 1951, Greece and Turkey. In May 1955, when the occupation of Western Germany ended and it became a completely independent state, it also became a member of the NATO. Under the treaty, if any one of the signers is attacked, the others will regard it as an attack against them all. Each country promises to take whatever action it thinks necessary, even military action, to help another member defend itself.

THE UNITED STATES

Why are United States people called Americans? The practice arose more than a century and a half ago, when the United States was the only independent nation on the Western Hemisphere. The complete official name of the country, the United States of America, was too long for everyday common use, so the shorter form, America, became accepted. As for the people, it would not sound well to call them "United Statesans," so the name Americans was generally used.

CANADA

Is Canada a democracy? Canada, a self-governing member of the family of nations that make up the Commonwealth of Nations, is one of the world's great nations in her own right. Canada's sovereign is Queen Elizabeth II, the head of the Commonwealth, and her representative in Canada is called the governor general. In both England and Canada, however, the people govern themselves through their own democratic Parliament.

WONDER QUESTIONS

What were the seven wonders of the ancient world? The Seven Wonders of the ancient world were: the Pyramids of Egypt; the Hanging Gardens of Babylon; the Temple of Artemis at Ephesus; the statue of Zeus by Phidias at Olympia; the Colossus of Rhodes; the Mausoleum, or tomb of Maussolos, at Halicarnassus; and the Pharos of Alexandria.

MEN AND WOMEN

Why are some people dark and some fair? If we examine with a microscope the structure of the skin of animals or human beings, we find that it is made up of numbers of cells arranged in layers. Among these cells is found coloring matter, or pigments, as the artist calls it; and it is the quantity of this coloring matter present in any individual which causes the complexion to be called fair or dark. In very fair people there is very little pigment; in very dark people, with brown eyes and black hair, there is often a great deal of pigment; while others with a medium amount of pigment are neither very fair nor very dark.

GOLDEN DEEDS

What was wrong with Achilles's heel? Achilles was a mythical hero of ancient Greece, the ideal of youthful strength, beauty and courage. According to the legend, while Achilles was still a babe his mother dipped him in the River Styx, which protected his body forever against any weapon—with one important exception. The river water did not touch the heel by which his mother held him. That was his weak spot; and he died at Troy from an arrow wound in that heel. Nowadays, if we know that an otherwise strong person has a weakness, we call it his Achilles' heel.

THE FINE ARTS

What does the orchestra conductor do with his baton? The conductor's part is much more than that of beating out the time. The composer sets down the notes to be played or sung. The musicians produce the corresponding musical sounds. The conductor takes these scattered efforts and with them weaves the enthralling story that holds his audience spellbound. Yet there is an important mechanical side to his work. Notice that kettledrum player standing at the back. See how keenly he watches the conductor. He is not playing, but is busy counting the seventy-four bars' rest allotted to him. Now watch the conductor. He gives a quick glance at the player, to be sure he is prepared for his entry. Then the baton gathers in the brass. The excitement is growing. Suddenly the conductor's left hand shoots out, and the kettledrums crash in confidently. So the conductor shepherds the members of his flock—showing them, not only when, but how, to play.

THINGS TO MAKE AND THINGS TO DO

What power keeps a kite floating in the air? The material of which a kite is made is spread out as wide as can possibly be, so that it has a large surface for the air to hold up. The ocean of air above the earth is always moving, and is full of currents and tides, just like the ocean of water, and the kite floats on these currents just as a raft floats on the moving waters of the sea. When the kite is slanted to the wind in the proper way, the pressure of the wind forces it to rise. If the wind pressure is not strong enough to make the kite rise, we run and pull the surface against the wind, which increases the pressure and raises the kite.

WALT DISNEY

The world's most popular, most honored creative genius of the screen and one of the great educators of our time, whose films have revolutionized the techniques of education and entertainment, celebrates his fortieth anniversary of brilliant, versatile achievements in motion pictures.

by the Editors of Wisdom

IN TRUEST AMERICAN TRADITION, Walt Disney rose from virtual obscurity to become, through his beloved character creations, filmland's greatest success, and a popular good will ambassador throughout the civilized world. By virtue of his unsurpassed imagination, native genius, determination and resourcefulness, he has utilized all so effectively as to become a world renowned, self-made pioneer in creating highly entertaining, thoroughly delightful, colorful, cultural and educative motion picture spectacles in works of artistic supremacy. He has influenced for good and freed the imagination of youth in every free land.

He has made outstanding contributions to education in bringing to the screen the classics in fantasy, and the wonders of nature in his True Life Adventure films. His creative imagination has brought the priceless gift of joy and deep laughter to a world starved for happiness, and has opened a universe of enchantment to people of all ages and all nations.

For forty years his creations have stirred people to wonder and admiration, and to various conjectures on his marvelous powers. So intense is the enthusiasm of his followers that he has received, with modest dignity, the highest honors the motion picture industry and an appreciative world can bestow upon him. He has been consistently outstanding with his productions of warm, wholesome, delightfully refreshing film fare of fact, fiction and fantasy, and has earned the world's tribute not only by the pleasure he has given to hundreds of millions of people, but also by the character and good taste of his beautiful productions.

No other creative artist in history has ever drawn so many spectators at any one time. The fertile and enlightened mind of Disney has provided the world with delightful fantasy that is not entirely unreasonable as practiced by these resourceful, completely humanistic animals. The merry antics and delightful foolishness of Disney's lovable characters

Renowned as the world's most honored citizen, Walt Disney has received, with modest dignity from an appreciative world, innumerable Academy Award Oscars, honorary degrees from universities as Yale, Harvard, Purdue, Southern California, decorations from foreign governments and countless awards, gold medals, trophies, and citations for distinguished achievements from national and international organizations, newspapers, magazines, churches and the United States government. In this photograph, Disney is shown holding his latest coveted honor, the Wisdom Magazine Award for "Significant Contributions to Knowledge and Education and Distinguished Service to Mankind."

have not only brought laughter and happiness to all the world, but so often have carried useful teachings for humanity and an underlying message of wisdom. They have played an important role in our endeavors for international good will. He has accomplished something that has defied all the efforts and experiments of the laboratories in zoology and biology. He has given impressive significance to the word *anima* in animated. He has given animals souls.

Walt Disney's patriotism and his genius were devoted almost exclusively during World War II to the making of training films for our Armed Forces. During the war his artistic powers were an effective force in maintaining the morale of our fighting forces. The rigors of training and fatigue of battle were often forgotten under the spell of his creations. The children of Disney's imagination cheered the gloom of monotonous duty, relieved the tensions of hazardous missions, and lifted the morale of men isolated from the normal companionships of society. His creative genius also furnished vital educational techniques during World War II. Every man in the Service felt a debt of gratitude for the tremendous boost in morale furnished by Disney's well loved creatures.

His phenomenal success is simple logic. It is purely a case of the world beating a path to the door of the man who built a better mouse. With this mouse he conquered the whole world. No man ever labored so steadfastly and creatively to enlighten the world by discoveries proceeding from creative imagination, observation and experiment. He is the creator of a new language of art and has brought the joy of deep laughter to millions by touching the heart of humanity without distinction of race, creed or religion. His work has the elements of great romantic art. The beautiful, the fantastic, the grotesque—all combine an irresistible and ineffable charm. Having outdistanced all competitors as a successful motion picture producer, he has never been equalled, certainly never excelled.

Walter Elias Disney was born on December 5, 1901 in Chicago, Illinois. His parents, Elias and Flora Disney, had five children, Raymond, Herbert, Roy, Walt and Ruth. In the belief that rural life would be beneficial to their family, the Disneys moved to a small farm near Marceline, Missouri.

Walt was thrilled by the beauty of the farm—green fields, apple orchards, a herd of dairy cows, flocks of chickens—and believes that his later success with Mickey Mouse, Donald Duck and other Disney animal characters stems directly from his childlike excitement with the wonders of nature. Even before he was old enough to attend the country school near his home his talent for drawing was evident in the form and detail of his sketches of farm scenes. "What I liked to do best, as far back as I can remember," Walt recalls, "was to draw. I don't know why; nobody else in the Disney family was at all artistically inclined. The other boys are businessmen, including my brother Roy, who handles all of the Disney Studio's business affairs. My parents were not the type who delighted to show off their children's talents. Although I got no particular inspiration from my family, I could always count on sympathetic interest and encouragement. My favorite aunt supplied me with pencils and drawing tablets."

The privations and rigorous hardships of farming, combined with his father's suddenly failing health, forced the Disneys to sell the farm and move to Kansas City, Missouri. They purchased a newspaper delivery route which was operated as a joint family enterprise. Walt, who was only 9, and his brother Roy, delivered morning and evening papers to 2000 customers.

When his parents moved back to Chicago, Walt remained to complete his school term and work at his first real job. He became a news "butcher," selling fruit, candy, soft drinks and magazines on passenger trains running out of Kansas City. This venture lasted only two months and was doomed to failure from the start—he was his own best customer and consumed the meager profits. Walt returned to his family in the late summer of 1918 and, while attending high school, worked at various part time jobs to finance a course at the Academy of Fine Arts. By this time his brothers and friends had been called to service in World War I and, although still too young to be drafted, Walt became restless with school and obsessed by a desire to volunteer.

After being turned down by the Army, the Navy, and even Canadian enlistment offices because he was only 17, Walt finally succeeded in concealing his age and enlisted with the American Red Cross. He was disgusted to find himself still in a training unit when the Armistice was signed, but shortly thereafter he was sent to France as a replacement ambulance driver. He spent the next year driving an ambulance and chauffering Red Cross officials, and returned to the United States with $500 in cash, earned when other drivers admired the original drawings with which he camouflaged his own ambulance and plied him with money to paint Disney characters on their vehicles.

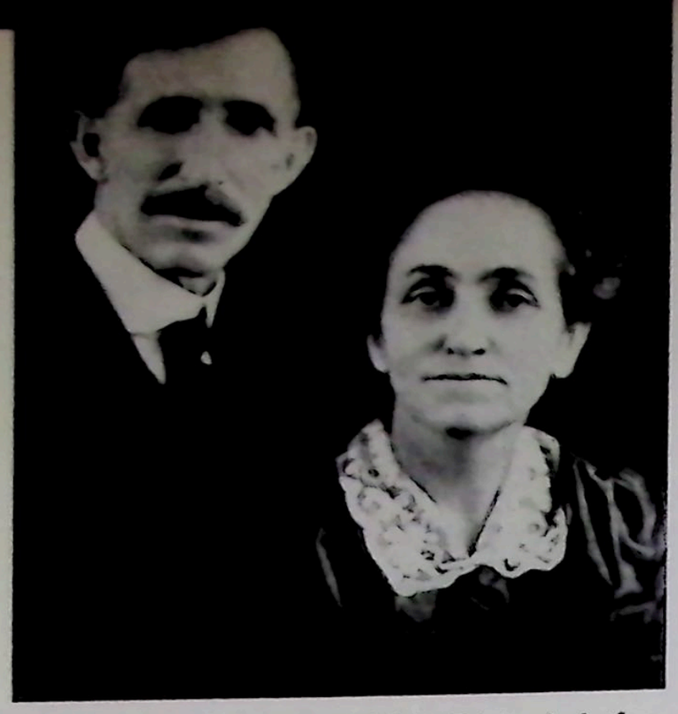
Although he had not completed his education, Walt had been away too long and felt too old to return to high school. He was determined to become an artist, and in the fall of 1919, finally was hired by an advertising agency in Kansas City and paid $50 per month to design pencil sketches for Christmas catalogues. As soon as the Christmas rush was over he was discharged. Walt was confident that he had gained enough experience in less than two months to enable him to go into business for himself as a commercial artist. He secured free desk space in the office of a small newspaper in exchange for advertising drawings. It was here that he met another young apprentice artist looking for a job, Ubbe Iwerks, who is still a member of the Disney staff. The two men formed a partnership and began doing free lance art work designing letterheads and theatre ads. Although their combined efforts earned $125 for the first month of their partnership, they continued to search for a better opportunity.

When a slide company in Kansas City advertised for a cartoonist, Walt turned the commercial art business over to Iwerks and took the job for $35 a week. "I know I wasn't worth it," he says, "but I decided to try. It was at the slide company that I got my start in the animated cartoon game. That was around February, 1920. Two months later my partner was working there with me. We made animated advertising films, and my boss let me take home an old camera that was lying around. I rigged up a studio in a garage and started experimenting in my spare time. At the slide company we used the old cut-out method of animation, joining arms and legs together with pins and moving them under the camera. I found a new method of animation in a book from the library, tried it out and convinced my boss it was a better system, so he installed it."

Walt's efforts resulted in the production of a series of short animated cartoons of local news events which he sold to the owner of three large Kansas City theatres. But he was impatient. He could not afford to quit his job and he longed to expand his experiments in animation and attempt more ambitious projects than he was able to manage alone. He rented a small shop and attracted several young amateur cartoonists with the opportunity to work with him in the creation of a new idea—the animation of fairy tales. For the next six months Walt and his "staff" devoted their evenings and spare time to producing a short subject called *Little Red Riding Hood*. When the film was completed Walt resigned from his job, formed his own company called the Laugh-O-Gram Corporation, and began filming animated modernized fairy tales. Seven films were produced, and, although they were sold to a New York distributor Disney and his associates, the Laugh-O-Gram Corporation, never realized a penny—the firm went bankrupt before payment was made. There was no money to meet his small payroll and Disney was forced to disband his staff. In an effort to save his company and avoid bankruptcy Walt tried every possible combination in an attempt to develop a novel idea that would sell. Finally a plan evolved for putting a real person into an animated cartoon, and Disney's film based on this idea was titled *Alice in Cartoonland*. Finally, he had no alternative but to declare bankruptcy, but his creditors permitted him to keep a print of the film of *Alice* as a sample.

Walt, broke, without a job and heavily in debt, decided to join his brother Roy in Hollywood. To provide money for transportation he canvassed the better residential districts of Kansas City taking movies of babies which he sold to their proud parents. By selling his camera he finally accumulated enough money for a train ticket and, with a two-year-old suit, a sweater, some drawing materials and $40 in cash, he arrived in California in August, 1923.

Walt put aside his cartoon samples, having convinced himself that he would have no difficulty in obtaining work as a movie director. After



An early photograph of Walt Disney's father and mother, Mr. and Mrs. Elias Disney.

Walt Disney, at the age of 14, in the back yard of his home in Kansas City, Missouri.

Working at his first free lance job of designing letterheads and theater ads. Disney traded advertising drawings for desk space in a small newspaper office.

The ambulance driven in France by Walt Disney during World War I was readily identified by his cartoons.

fruitless weeks of haunting the movie studios he was amazed to find that his $40 had been used up and, although he had given up hope of being a director and was ready to accept any type of work, he was unable to find employment. In desperation and without any real hope of finding a buyer, he sent his sample *Alice* film to New York City. Gathering up his cartoon equipment and with the encouragement and financial help of his brother, he again returned to cartooning. Suddenly a New York distributor offered $1500 each for a series of 12 *Alice* cartoons. Walt and Roy were in business! With $500 in borrowed capital they formed a partnership—Roy, who is now President of Walt Disney Productions, was business manager and Walt was the artist.

They bought an old camera, found a barn-like room which they furnished with old boxes in lieu of tables, and Walt began drawing day and night. He instructed Roy in the use of the camera, and assisted by two young girls hired at $15 a week, they produced the first cartoon of the series. One of those two girls, Lillian Bounds, later became Mrs. Walt Disney. Walt is credited with the discovery of an entirely new movie technique in his use of a live-action girl and animated-cartoon animals in the *Alice in Cartoonland* films.

Walt's next creation for the New York distributor was an animated character named Oswald the Rabbit. Although Oswald was quite successful Walt had numerous ideas for improvement—all of which would take money. Unable to finance these innovations himself, he went East to discuss his plans, but was unable to convince the distributor of the necessity for altering an already profitable format. The contract was broken, the distributor usurped the rights to Oswald, appropriated most of Disney's artists, and continued to create Oswald cartoons.

Walt started home with a heavy heart. He had no cartoon character with which he could replace the lost Oswald, and no idea for a new one—cats, dogs, rabbits—all had been used. Finally, in a moment of inspiration he was reminded of a mouse!

Mickey Mouse, although destined to become world famous, was born in a time of crisis. Sound had just been introduced to films and the squeaky voice of Mickey, supplied by Walt Disney himself, had to compete with the synchronized sound of the first talking picture—Al Jolson's *Jazz Singer*. Several attempts to launch this new Disney character were dismal failures before *Steamboat Willie* became a hit in 1928 and catapulted Mickey Mouse on his way to becoming one of the world's cherished movie stars.

The spectacular success of Mickey helped turn the tide of Disney's career, eventually enabled him to build the multi-million dollar studio which now spreads over 51 acres in Burbank, California, and encouraged him to continue further experiments. His most ingenious innovation was the production of the first feature-length animated cartoon ever created—*Snow White and the Seven Dwarfs*. The release of this film in 1938 astounded the motion picture industry. Again this genius of animation had dared to pioneer in the unexplored realms of movie making.

Disney has consistently contributed more than any one person to the stature of the motion picture screen. He is recognized the world over for his achievements in the science of cinematography. Creator, producer, writer, director, artist—he has welded the arts of painting, music, and the drama into a new unity that has made a world public sensitive to the values inherent in motion pictures. His films are universally known as veritable poems of sound and color, which have given cinematographic art a new dimension. He has pioneered many significant advances in film presentation techniques, and has become known world wide for singular perfection in each of his productions. During his career he elevated the animated cartoon and the screen fable to a new eminence and developed animation to the point of a fine art. His genius added a new dimension to the screen when he created an animal kingdom of his own. With his talent and his charm, he has captured the hearts of more children, and more grownups, than any man who ever lived.

His films grow out of his imagination. Each is a new and distinct creation, demanding a different approach and different plan of attack. Hence the freshness, the variety, the organic oneness of his pictures. As with all true artists, he blends inspiration and imagination with precisionist technique. Through his films he has introduced people to the world's great music, to the civilization of foreign lands, and to loyalty

to their own country. His contribution has been the revelation of the power of cartoon animation, with sound, to open up new fields of expression and experience.

By freeing the imagination, he has enormously expanded the subject matter and emotional content of the motion picture. He has also enlarged the field of satire. Not the least of his contributions has been the perfection of a new way to teach. Through graphic symbols, animation, and other devices, he has given knowledge of health, education, and social problems, as well as technical know how, to uncounted numbers of persons everywhere who could not have learned so effectively, or at all, without his art and skill. Had he been content to retire after creating *Snow White and the Seven Dwarfs*, he would have retained our lasting gratitude for enabling us to recapture the childhood world of make-believe, of fantasy—but his brilliant and recurring triumphs continue to hold us enthralled. He has brought to the motion picture industry, and the world, not only a sense of humor but, equally important, a philosophy of cheer and good fellowship with the sweet simplicity and directness of a little child.

Walt Disney has an unusual fund of good sense, practical wit, vast human sympathies, an amiable twinkle in his eye, and extraordinary powers of observation. His mind is restless, strikingly deliberate, endlessly experimental, and yet filled with the artist's delight in the creation of many new things. Not in his whole lifetime has be been idle; not in all motion picture history is there another example of great natural endowments united to great industry and imperturbable common sense.

Disney's great and abiding passion is his art. He possesses the true creative instinct, without which no amount of labor and diligence would have made him a successful motion picture leader. In his creative years in Hollywood, he has accomplished an immense amount of work—a great deal more than any movie maker has ever done. The whole world sweeps through his imagination: the grim and the sweet; the coarse, the cruel, the lusty and the tender. He has so much to say that his pictures —comedies and dramas alike—are full to overflowing.

Culturally, he remains the boy who never graduated from high school, but his education in the true meaning of the term was gigantic. His interest in nature is scarcely to be described; it is omnivorous and encyclopedic, reborn each day, a mingling of scientific curiosity and poetic contemplation. He never counts the cost of labor, or regrets the hardships imposed upon him by his ambitions. There is always something new in the world to hearten him, some phenomenon to be investigated. The productivity of Disney has been stupendous. His studio, a rarity in Hollywood, is always running full blast and all hands strive to rival the terrific industry of the master. Disney, apparently immune from fatigue, bears the strain without brainstorms or the fitful displays of temperament which characterize the minor artist.

Walt Disney looks at the world and finds it good. He keeps his feet on the earth; he suffers no delusions, and with his candor, his wisdom, his kindliness, and his universal sympathies, conquers the whole world. He is endowed with strength and endurance and a finely balanced mind, a combination that enables him to finish one monumental job after another without draining his energies or falling prey to fits of temperament such as the successful Hollywood producer is so fond of affecting.

Disney is more than entitled to the world-wide acclaim he has received. There is no other creative figure on the American scene who has done so much to enhance the role of folklore and mythical tales to the millions of American children, as well as children and grownups all over the world. He is known and respected throughout the world as the creator and producer of enlightened, wholesome and educational entertainment. He is one of the great benefactors of the whole human race, for his inexhaustible well of fun and fantasy, mirth and merriment is a fountain of youth to a tired old world. He has effectively brought pleasure to a humanity that needs the healing power of laughter and beauty. He has made continuous and significant contributions in combining successfully the fields of entertainment and education for American youth. He is counted by all who know him as the most fortunate of men.

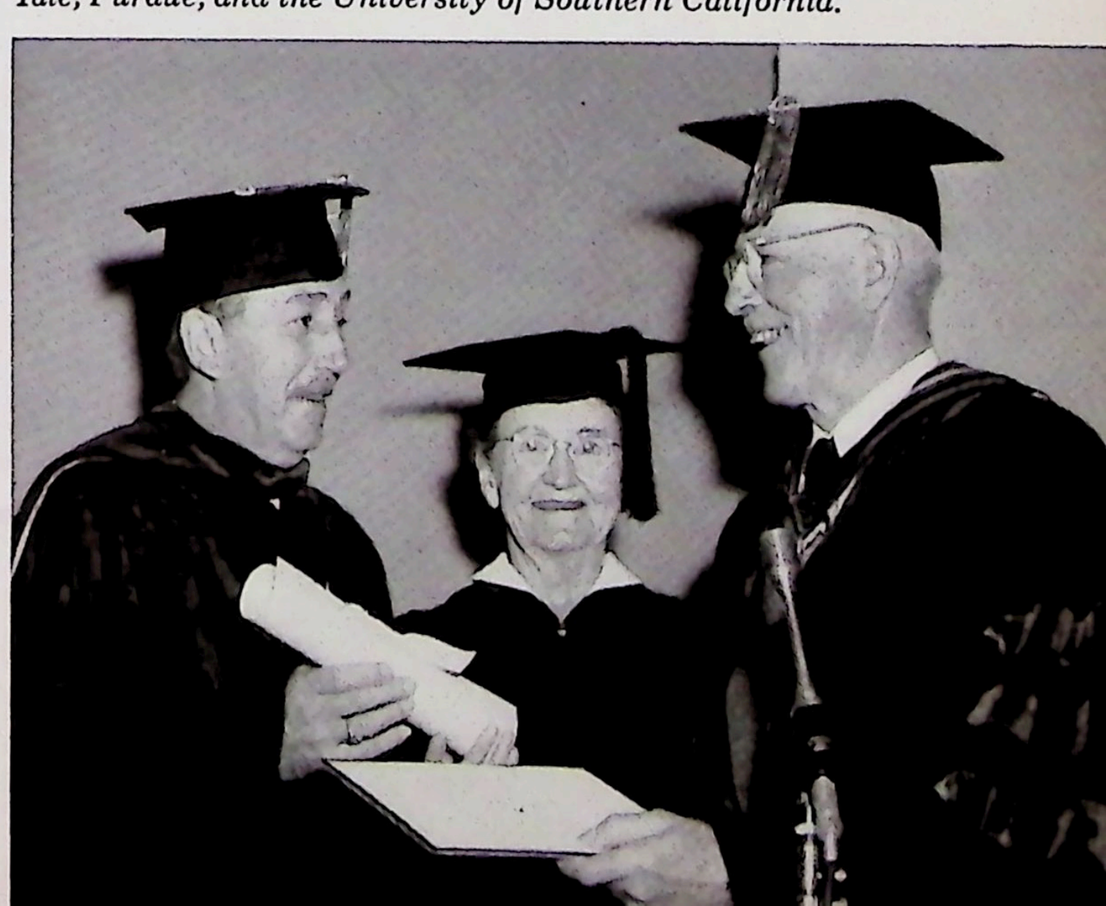
Of late he seems to have acquired new virility and creates new things with the ardency and dazzling power of one suddenly come into eternal youth. The creative fires of Walt Disney have never burned so brilliantly.

In an effort to get work for his small motion picture company in 1922, Walt Disney (gun in hand) demonstrated his acting ability in one of his own silent films.

Walt Disney (right) with his older brother, Roy O. Disney, who is President of Walt Disney Productions.

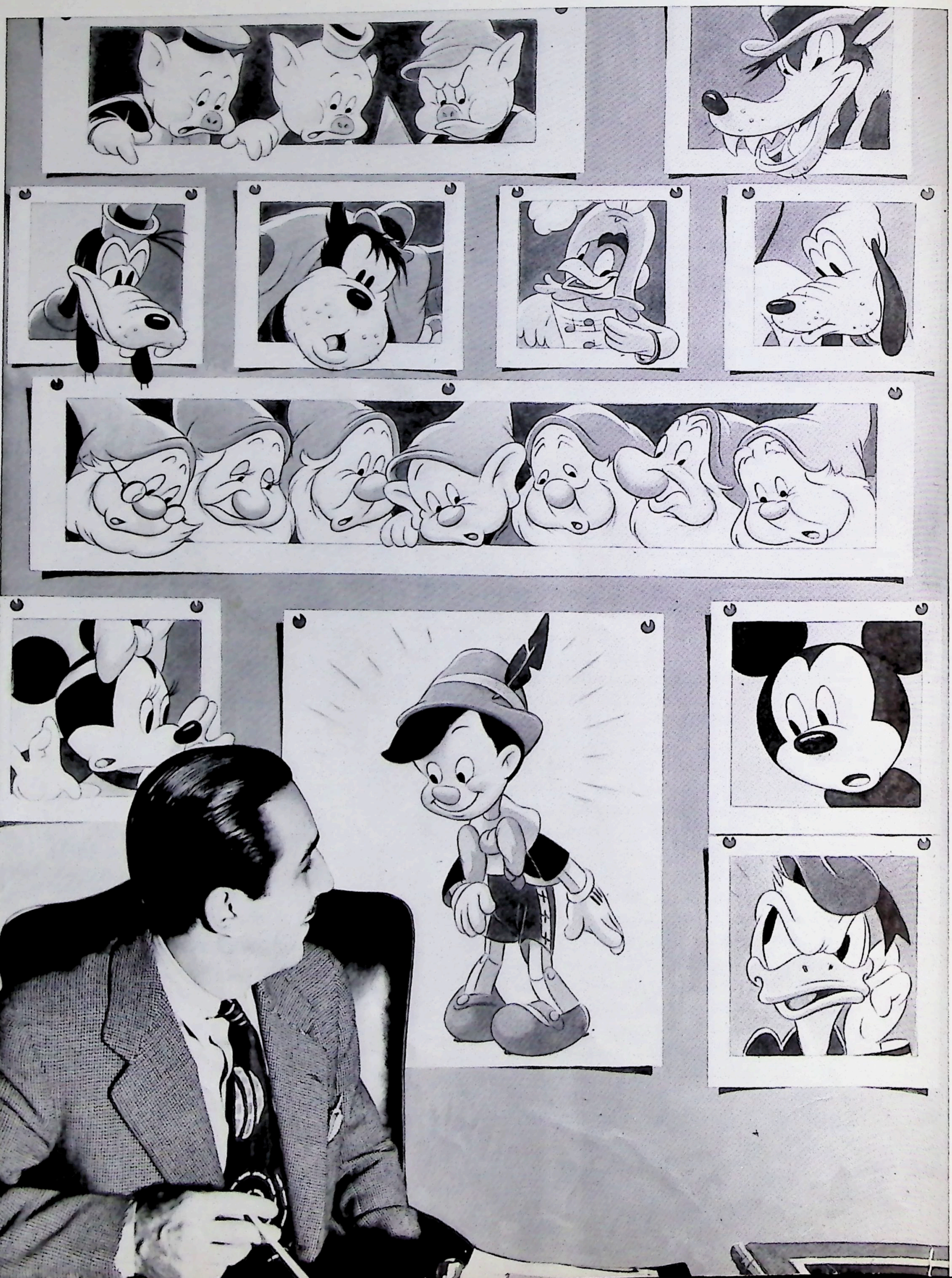
Walt Disney with his wife and daughters enjoying a day of relaxation at the Disneyland Hotel.

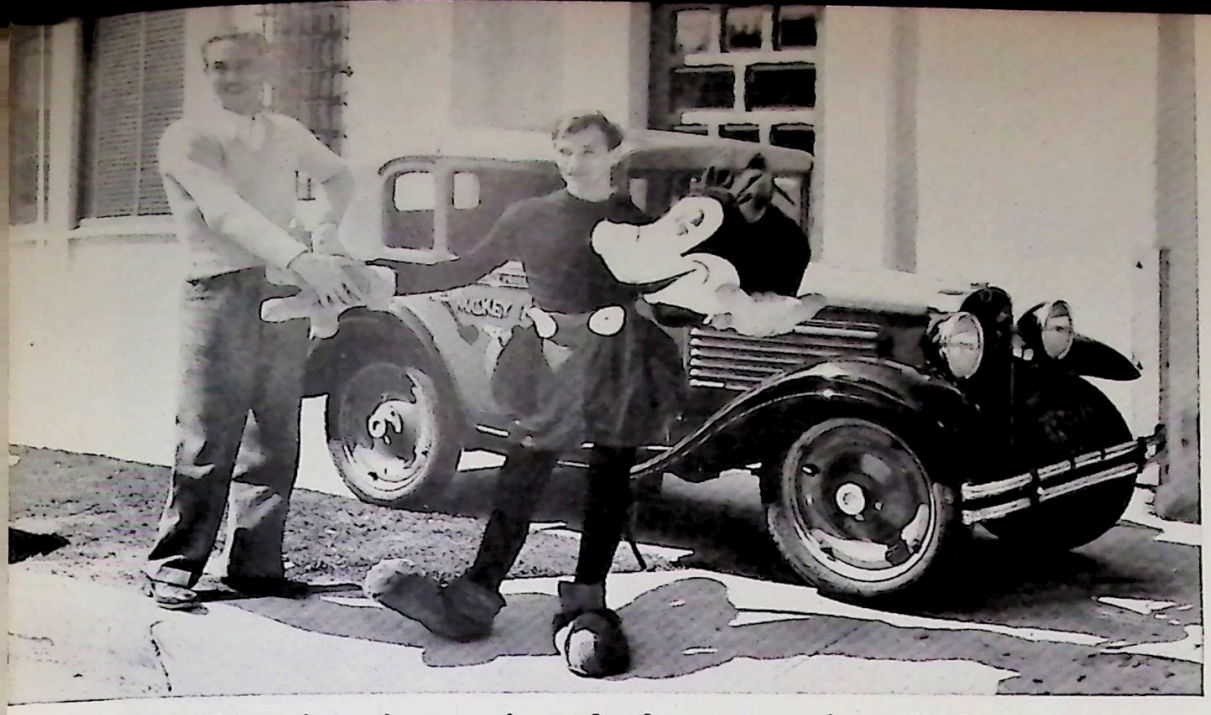
Disney has been awarded honorary degrees by Harvard, Yale, Purdue, and the University of Southern California.



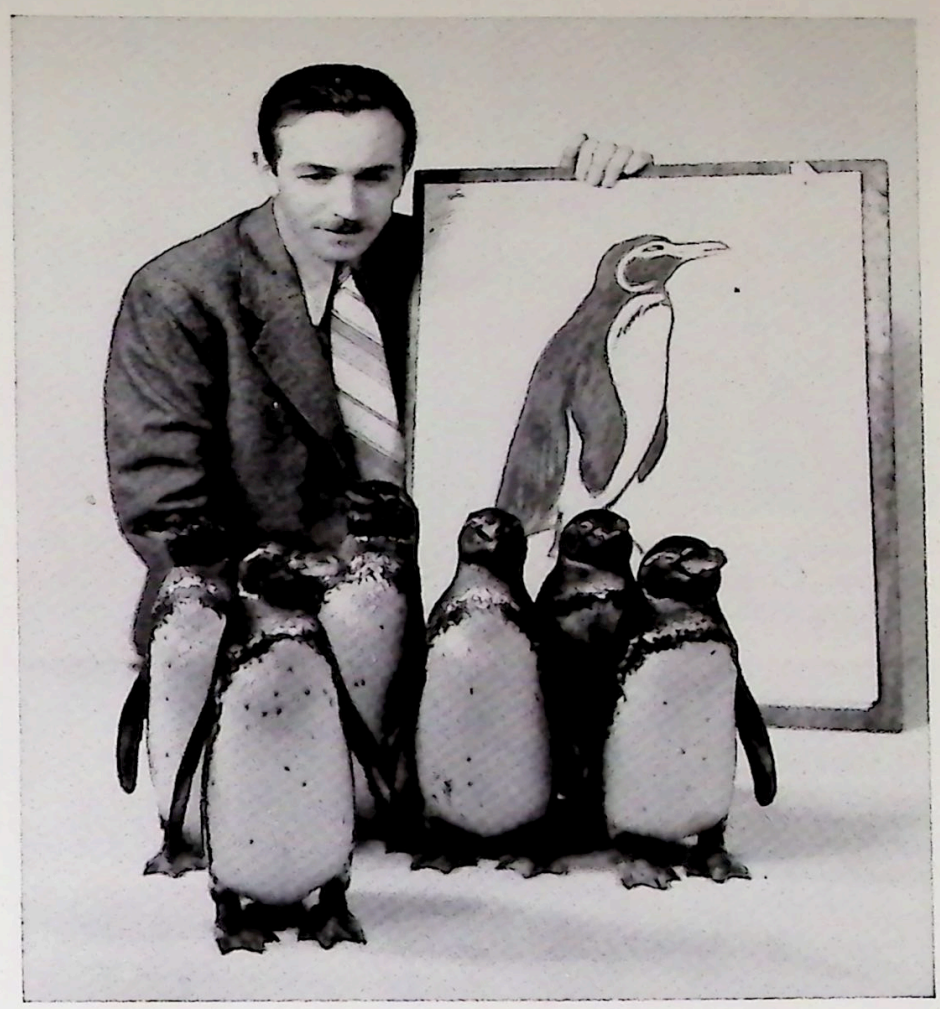
THE ANIMATED CARTOON WORLD OF

Walt Disney





Walt Disney's genius transformed a dream mouse into a lively personality, and the success of Mickey's animated antics encouraged Disney to continue creating cartoon characters.



Careful observation by Disney and his associates give authenticity to their animated creatures. Every characteristic and mood of these pompous penguins was carefully studied.

Only one who loves and respects animals could clearly capture in art their individual personalities. Disney studies two little fawns as he creates the beloved Bambi.

Disney's animated friends are drawn, studied and redrawn until sketches depict definite character traits and the drawings come to life as the little creatures assume individual personalities.

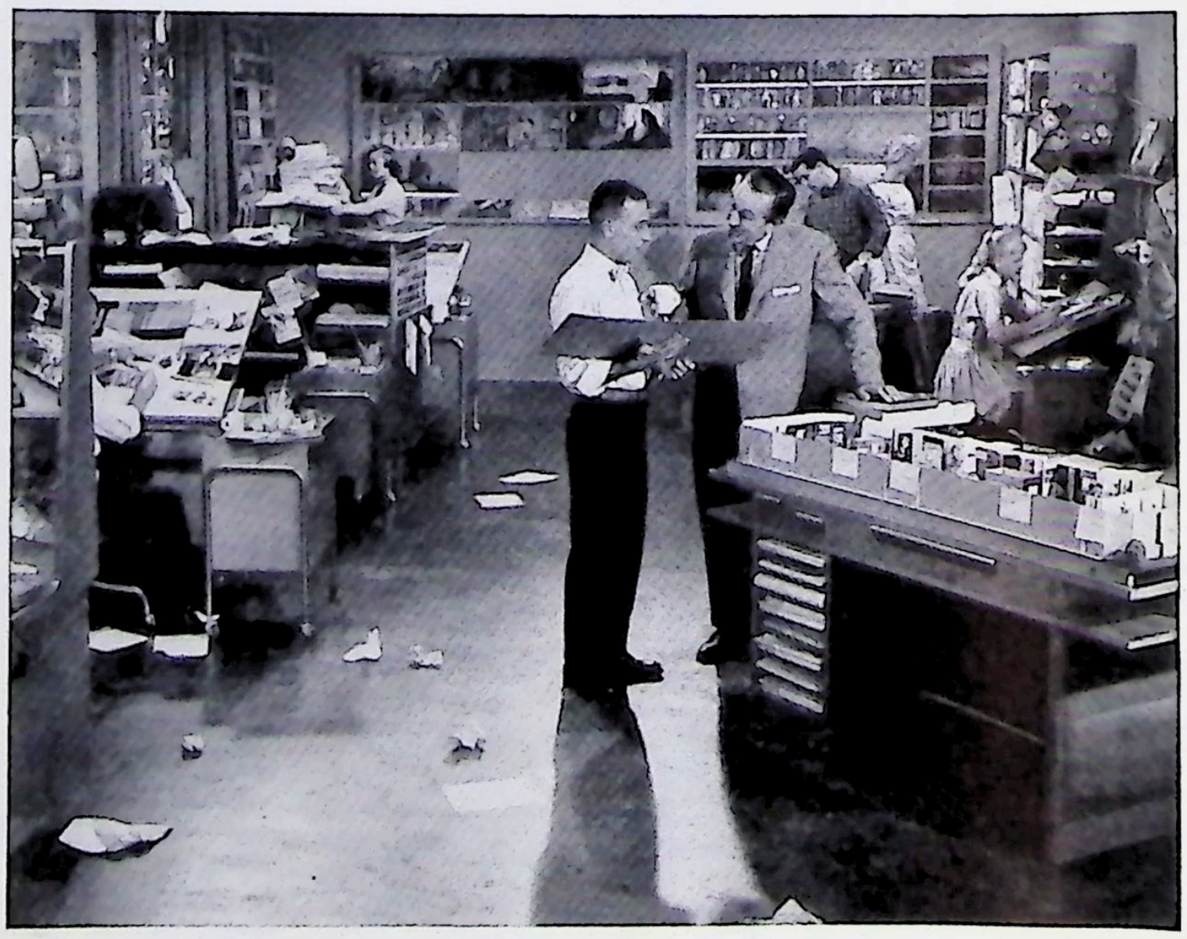
Characters drawn from the classics present a two-fold problem. They must remain faithful to the original story, yet fit the animated cartoon medium.

The Disney Studio artists must thoroughly study every facial expression and gesture of live models in order to portray realism and life in their illustrated cartoon characters.

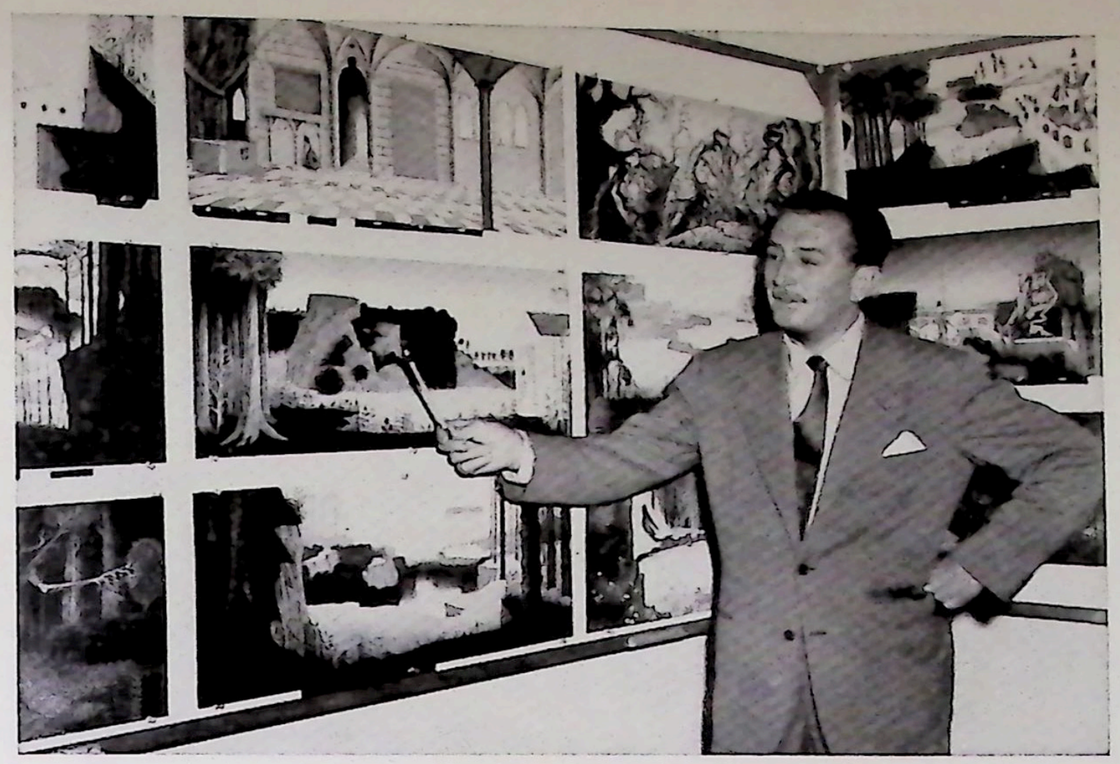
Disney and his artists enjoy their animated characters as much as the viewing public does, and delight in bringing each newly created member of the cartoon family to life.

Frequently the Disney artists, engrossed in creating a new personality, become models for their cartoon characters, often with amusing results.

Walt Disney and his staff discuss the storyboard which contains rough artists' sketches laying out the complete plot for the cartoon being animated.



The Disney workrooms contain all the ingredients necessary to create a fairyland or to bring a legend to life. Under the personal guidance of Walt Disney, artists create with inspiration.

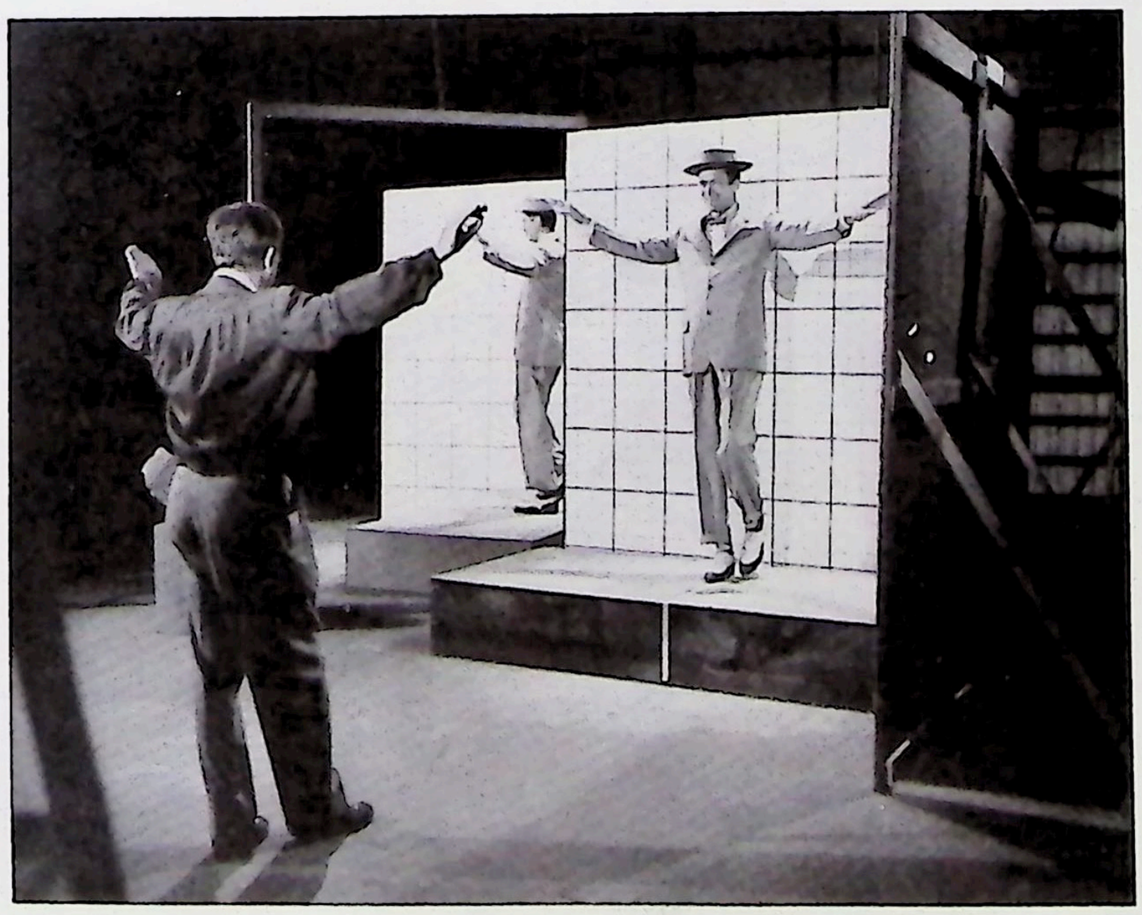


Each scene of a Disney animated cartoon is a story in itself, and each is an exquisite piece of art. Only a great creative artist like Walt Disney can inspire the talents of others.

Because he demands the best, and gives the best to the public, skilled artists consider it a privilege to be asked to perform in a Walt Disney production.

Walt Disney's full length feature film, "Make Mine Music," became an inspired production with lovely music and dancing.

Whether in a cartoon or live action feature, the ballet sequences present the ultimate perfection attained by dancers.



Walt Disney directs Buddy Ebsen as he expertly performs an intricate dance routine.

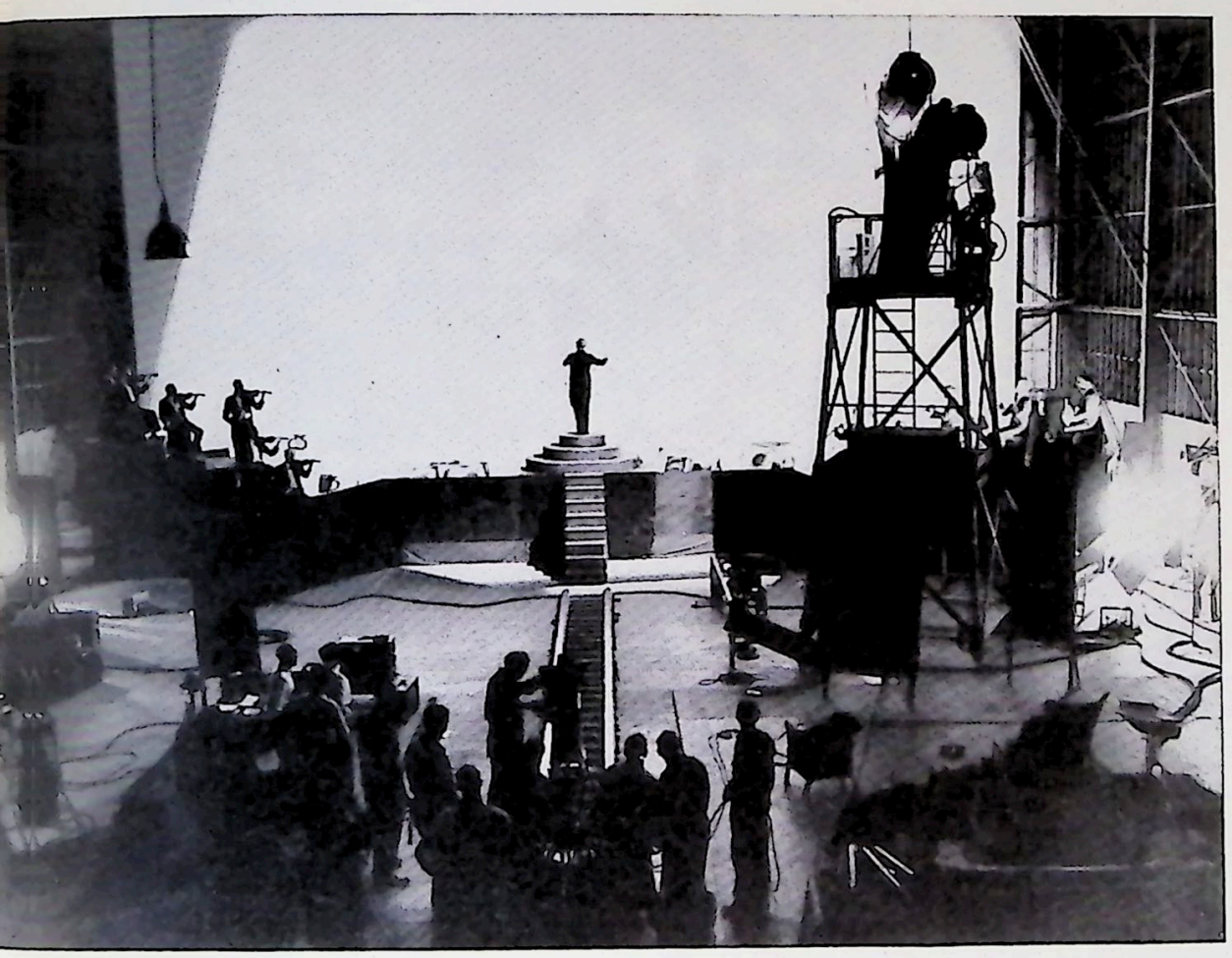
Walt Disney and Igor Stravinsky study the musical score for "Fantasia," an inspiration of legend and color; an education in music and sound.

Leopold Stokowski and Deems Taylor discuss a musical background for the animated scene illustrated on the storyboard.

Nelson Eddy sings a musical number for Walt Disney during a storyboard conference prior to the production of "The Whale Who Wanted To Sing At The Met," a scene from "Make Mine Music."

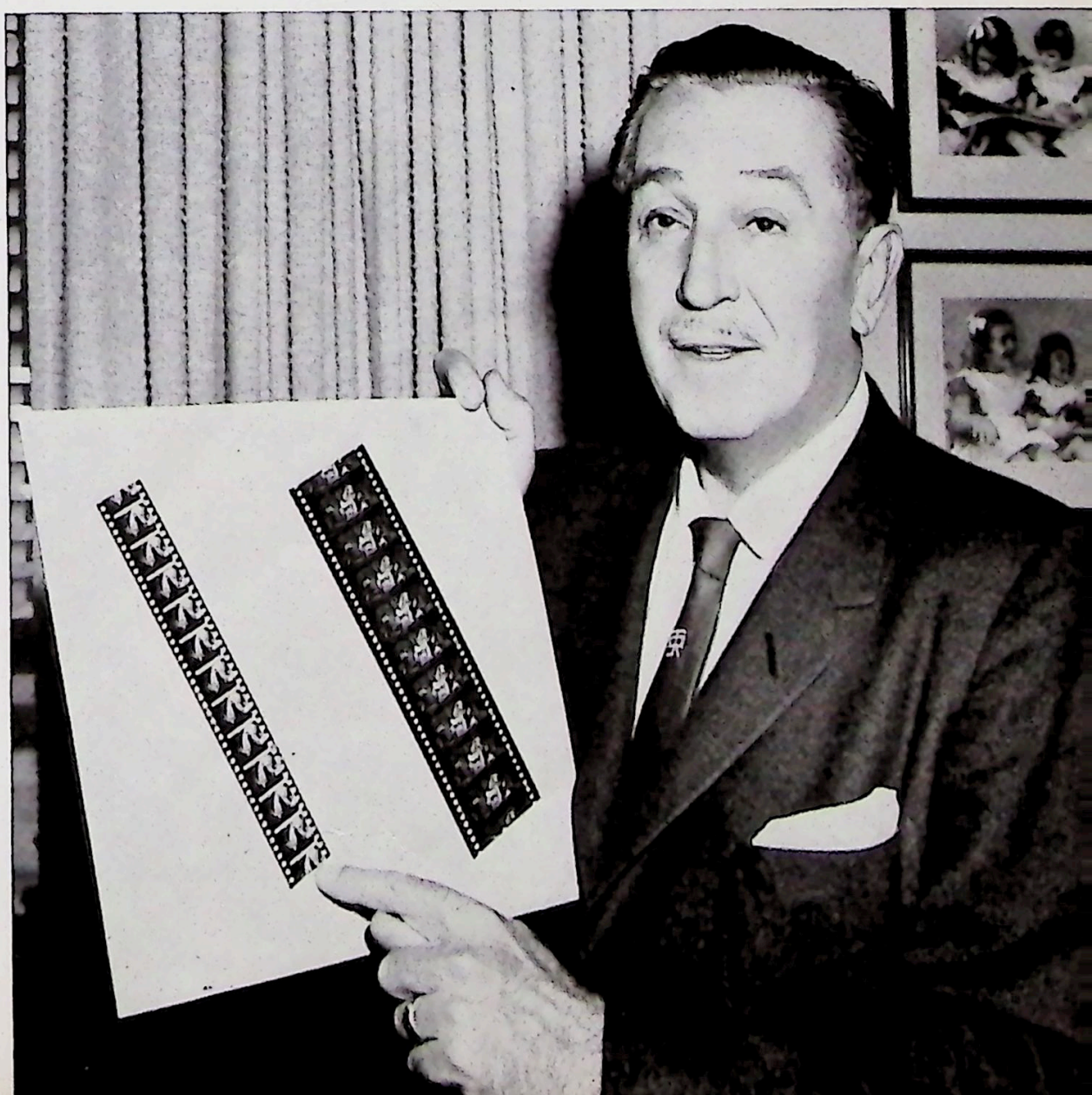
It is easy to create a life-like cartoon personality with a delightful live character for a model. Walt Disney checks the score for "Casey at the Bat" with Jerry Colonna, the "voice."

The precise synchronization of picture and sound in an animated cartoon production requires the utmost skill. Musicians and technicians confer with Walt Disney as musical scores and sound effects are combined with the film.



The Disney production sets and backgrounds are so cleverly designed that even shadows take on dimensions of power and beauty. Here, Leopold Stokowski leads the symphony orchestra during the production of "Fantasia."

Walt Disney, enjoying the challenging medium of television, produced "The Peter Tchaikovsky Story," one of numerous television features which won nation-wide acclaim.



All my particular ventures in mass entertainment are the result of constant experiment to touch the mind and heart of young and old with things of compelling interest. — WALT DISNEY

THE ANIMATED FEATURE LENGTH WORLD OF

Walt Disney

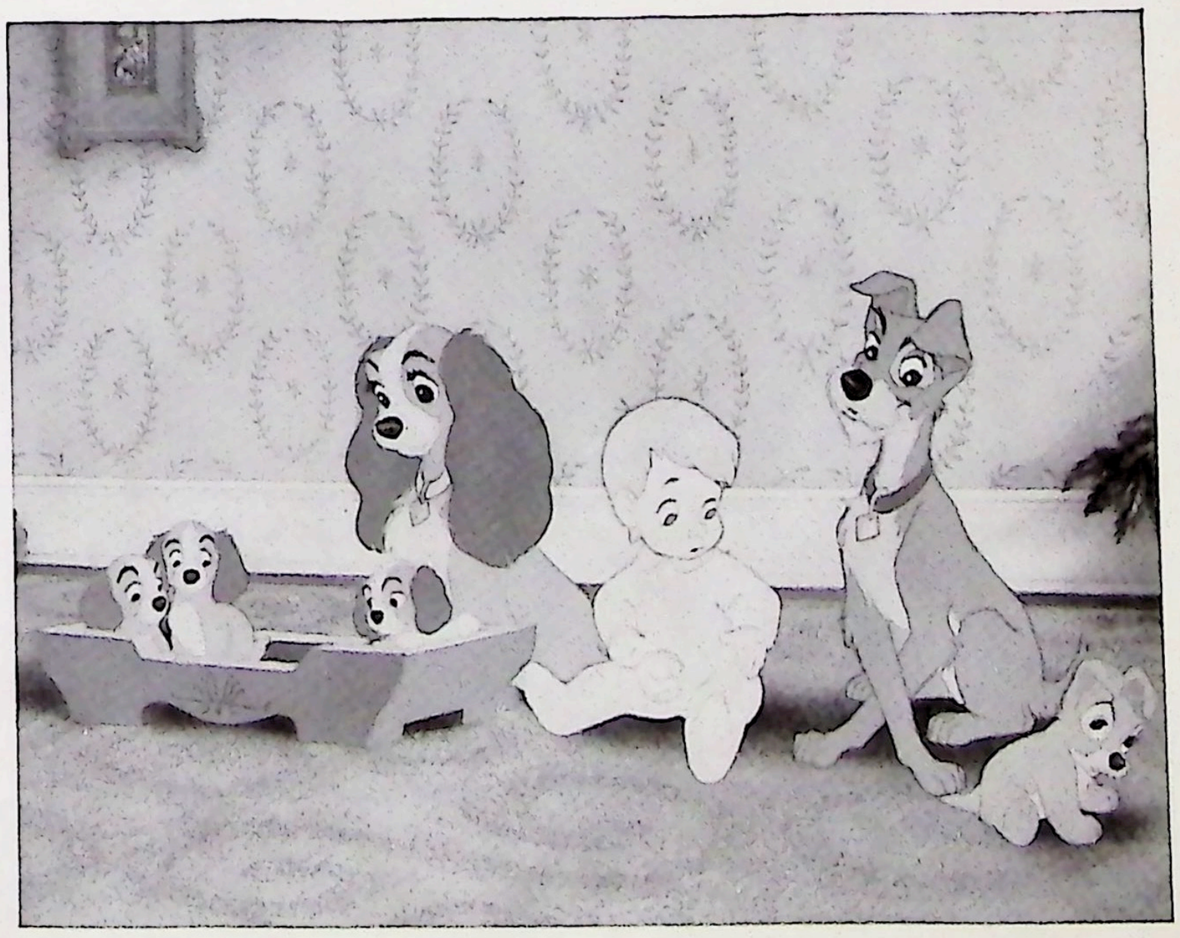
Ben and Me

Cinderella

Song of the South

Alice in Wonderland

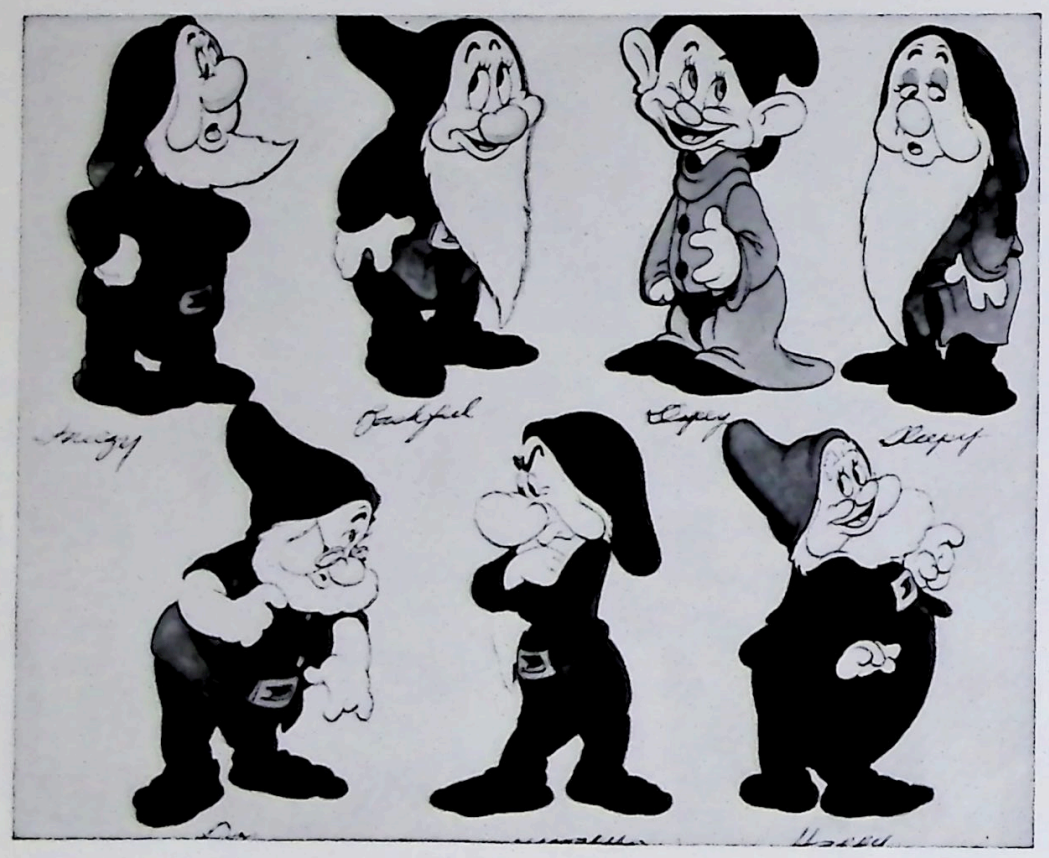
Ichabod and Mr. Toad



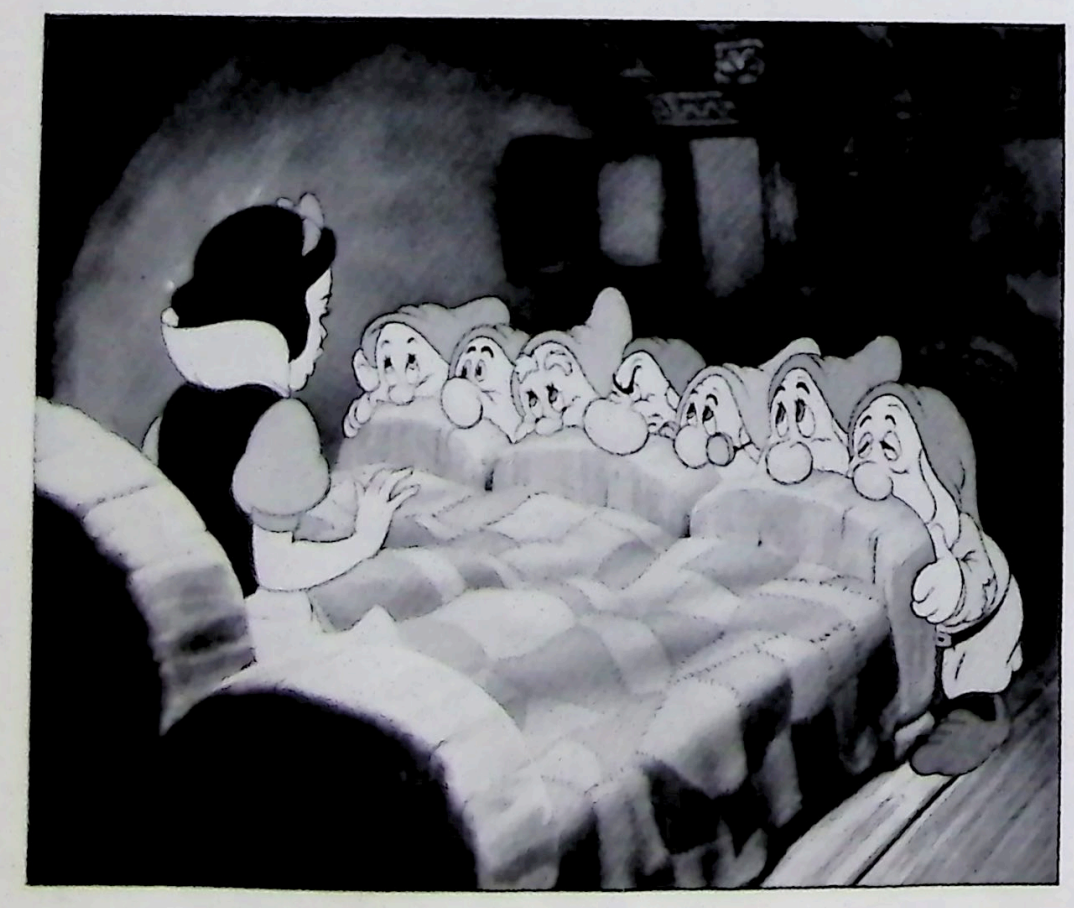
Lady and the Tramp

Snow White and the Seven Dwarfs

I hope that our picture-making may continue to offer useful humanitarian influence along with pleasurable entertainment in all our future dramas.—WALT DISNEY

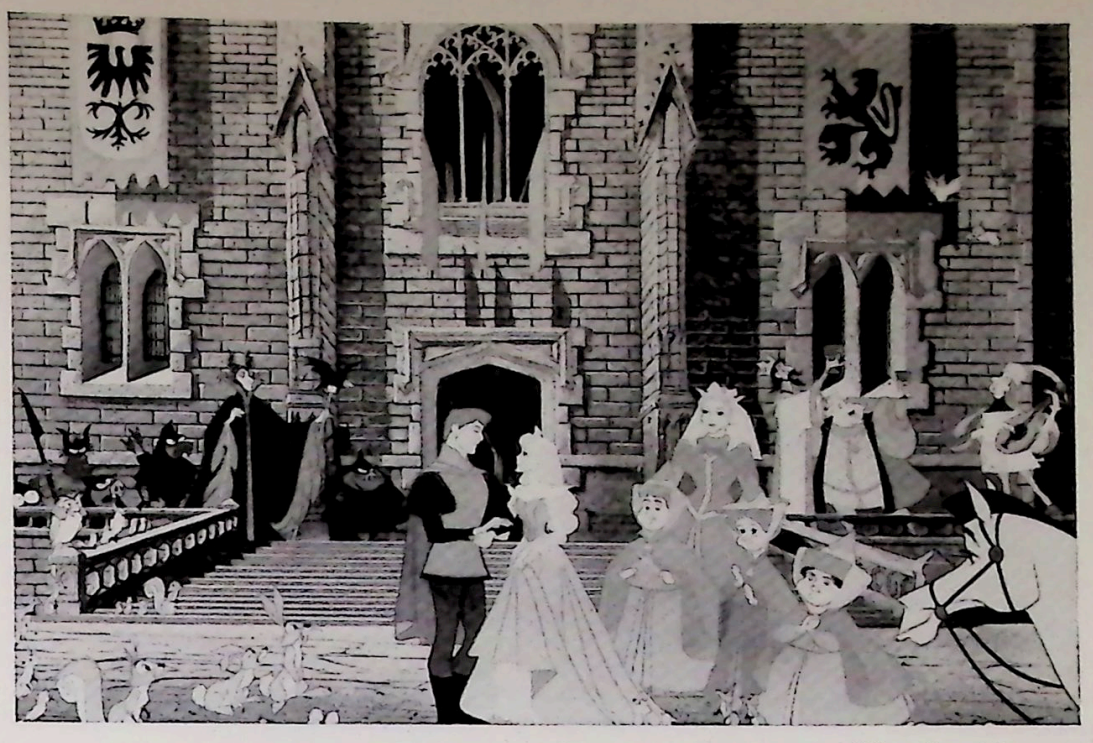


Peter Pan



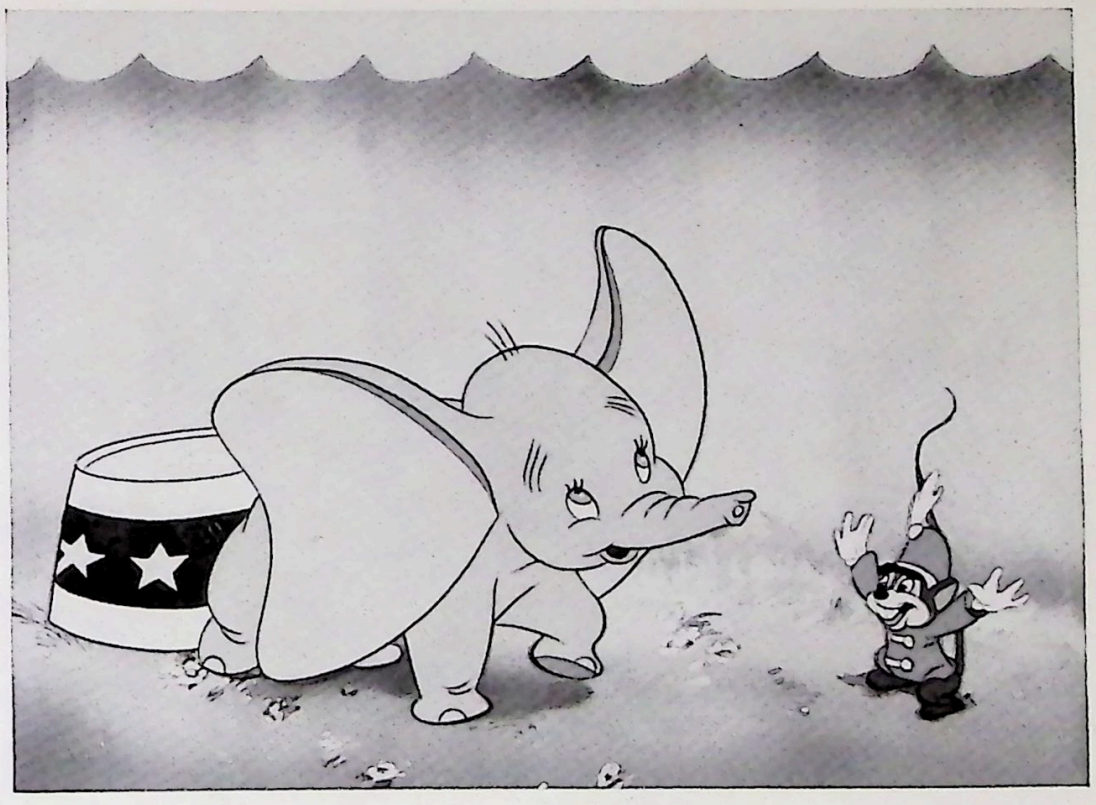
The more sound knowledge any presentation of book or film conveys, the more enthralling it is. And, conversely, the more beguiling a subject is, the more readily its informative values are imprinted.—WALT DISNEY

It is my pet phrase—and a deep belief—that people learn by laughter as much as by solemn pondering.—WALT DISNEY



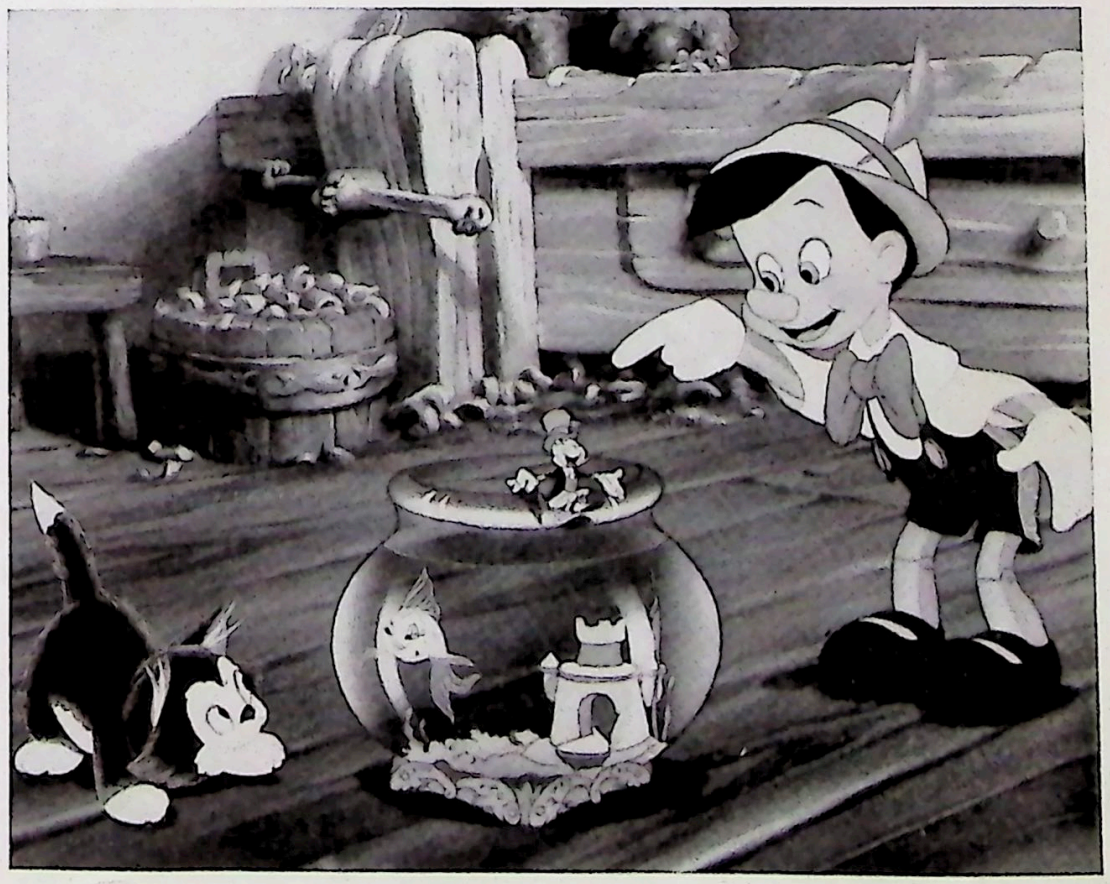
Sleeping Beauty

Fantasia

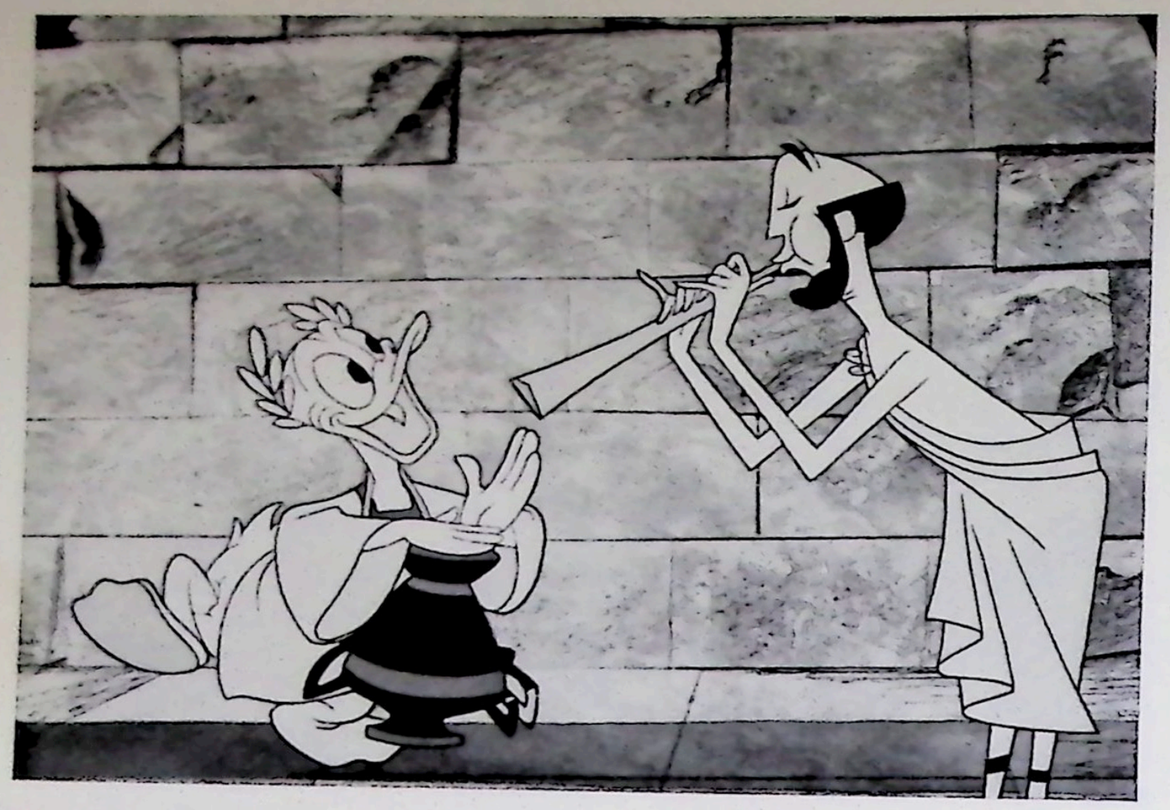


Dumbo

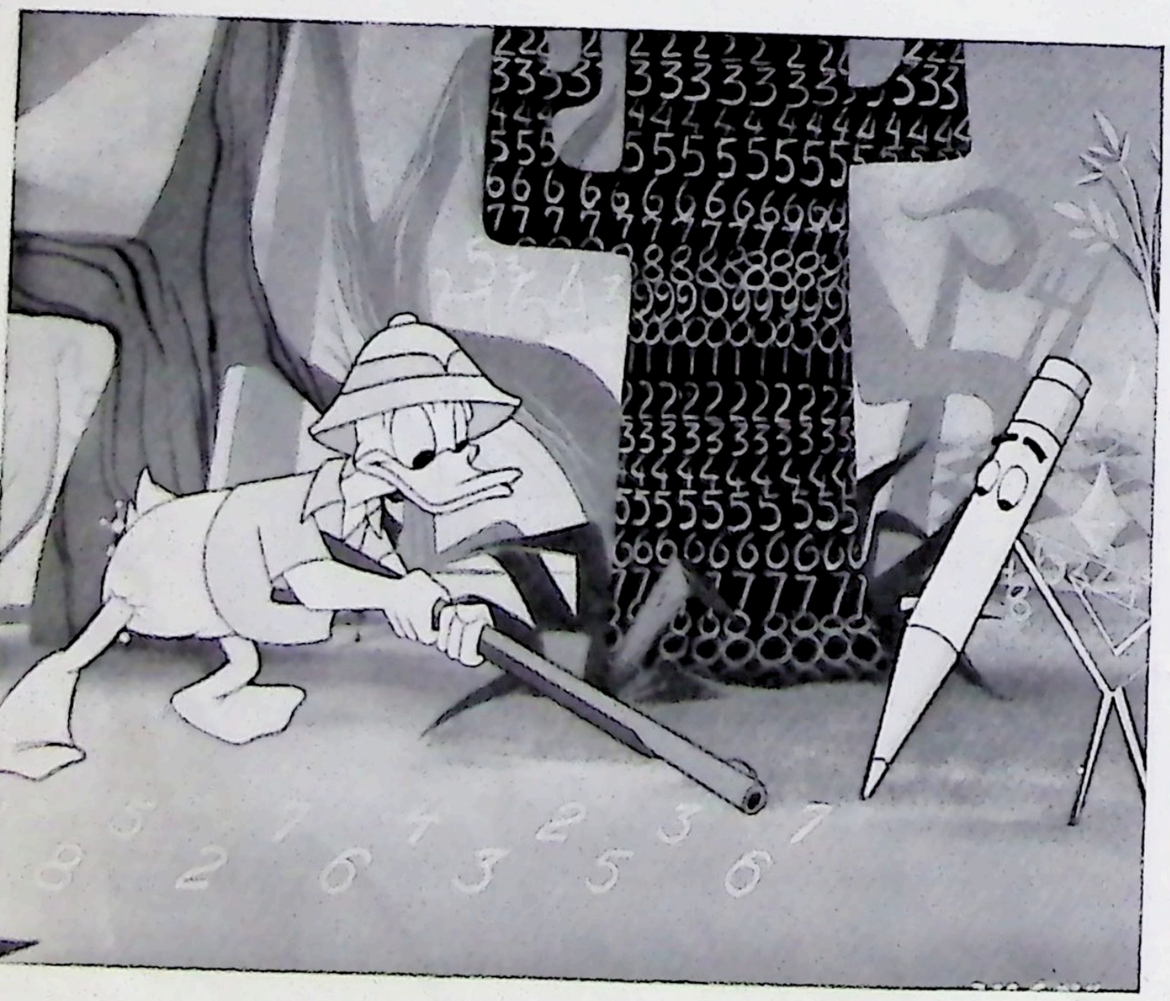
I don't think anything without heart is good or that it will last. To me humor involves both laughter and tears.—WALT DISNEY



Pinocchio



Donald in Mathmagic Land

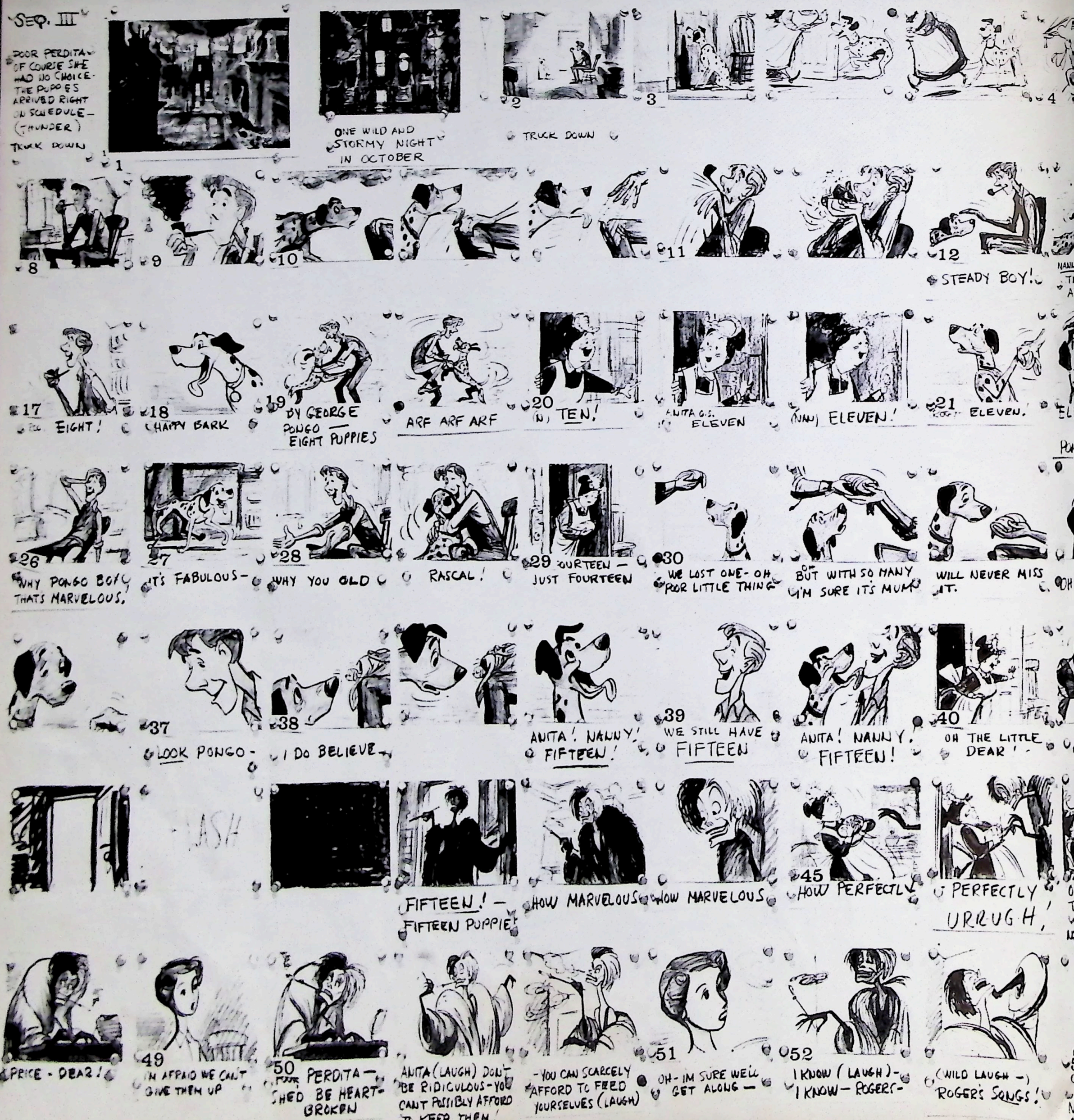


I am essentially a pleasure bringer, using my skill in communication. The character I invented had to insure pleasant entertainment for the multitudes with whom I have always identified myself. They need simple, basic stories whose emotions and passions could be understood at sight with very few explanatory words. — WALT DISNEY

101 DALMATIANS

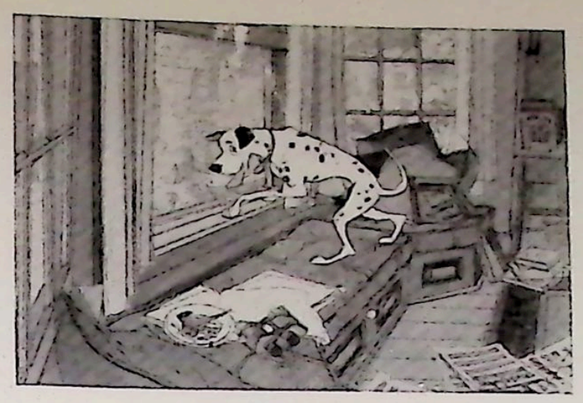
produced by Walt Disney

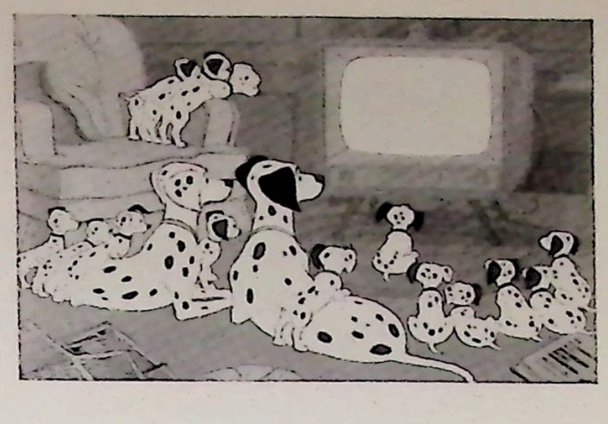
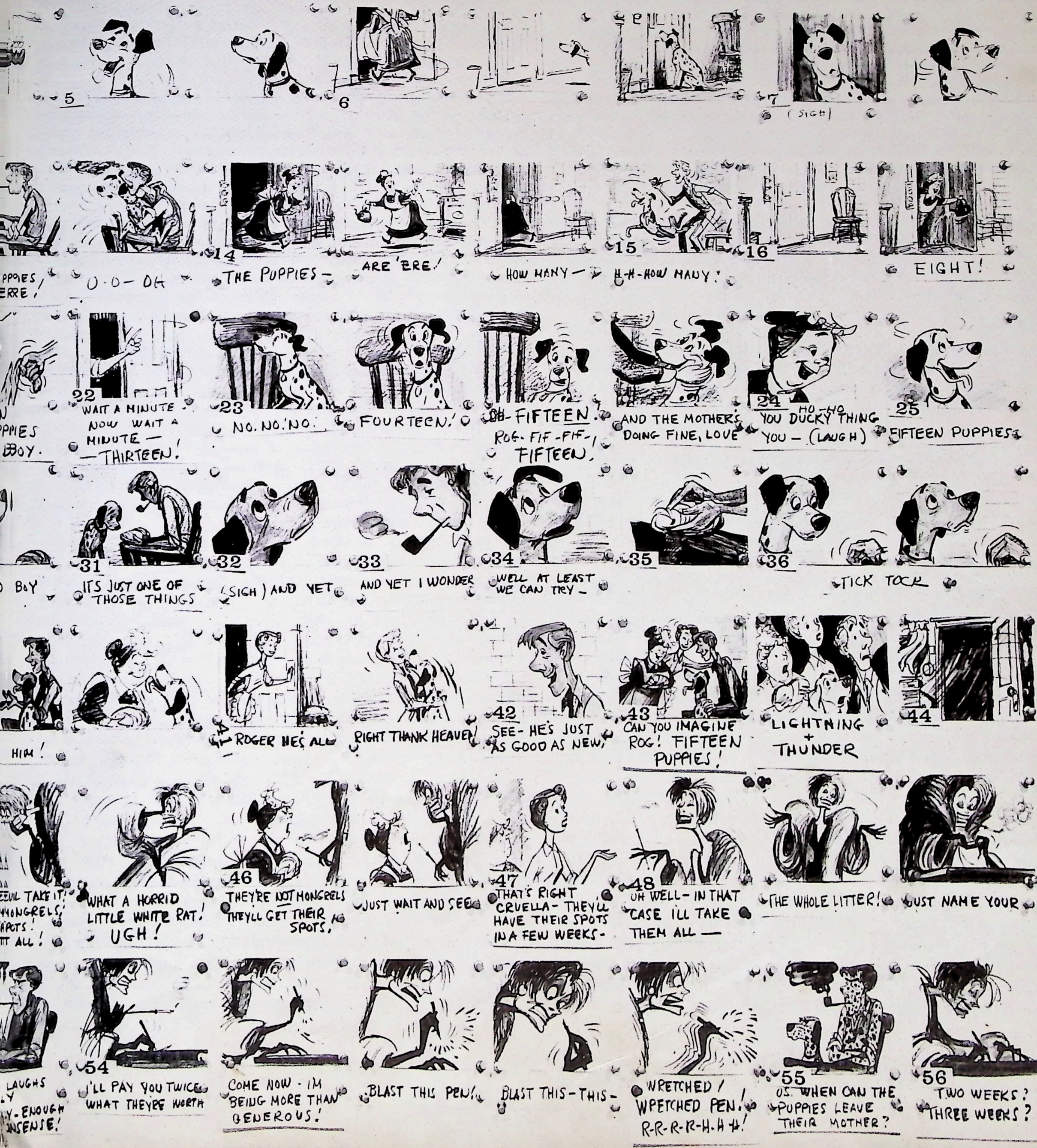
"101 Dalmatians," the most brilliant and unusual fantasy ever created and produced by Walt Disney and his studio, is an entirely new kind of feature-length animated cartoon. The storyboard, shown below, depicts scenes from this whimsical and heartwarming comedy-drama of the problems encountered by a lovable family of Dalmatian dogs. This story is told from the dog's viewpoint. The locale is London. It's spring. Near Regents Park, a bachelor flat is occupied by Pongo, a male Dalmatian, and his "pet" Roger Radcliff, a song writer. Pongo decides to find a mate for his "pet."

From his window, Pongo watches the women passing by with their dogs, on the way to the park. At last the right combination appears . . . the most beautiful creature on four legs—her dog, a sleek Dalmatian named Perdita, and a lovely girl. Pongo leads his master towards the girl. A friendship starts immediately. Time passes, Anita and Roger are married. Pongo and Perdita take the vows also. The first litter of puppies totals fifteen.

Cruella De Vil, a schoolmate of Anita's, comes to see the pups and offers to buy the lot. When she's turned down, she's furious and vows vengeance. Two of Cruella's hirelings break into the Radcliffs' place and steal the puppies. Great interest is aroused in the theft. Even Scotland Yard gets into the act, but no clues are forthcoming.

Pongo and Perdita decide, since all human efforts have failed, to resort to the "twilight bark." When they go for a walk that evening they bark three times, the "twilight bark" signal. Across London it's picked up by all the dogs. They're alerted and go into action to find the puppies. After some suspenseful and humorous events, the puppies are located, thanks to the dogs. Cruella and her hirelings are caught.

What starts out to be a sad Christmas Eve for Roger and Anita ends in a great celebration when their puppies are found. To top it all Roger sells his song and it's a big hit. He buys the old De Vil place where the puppies were held prisoner. Pongo and Perdita settle down to a wonderful life on a kind of Dalmatian Plantation.





THE ART OF ANIMATION

The technique of putting life and motion to fine illustration on motion picture film

by Walt Disney

IN EVERY age artists have recognized that color and form are not enough for a complete representation of life. Even the Stone Age draftsman felt the urge to make his picture move, but could not. Hindered by the lack of tools and materials, his imaginative efforts are still visible on the walls of prehistoric caves—drawings of beasts with several sets of legs, each set showing a successive stage of a single step or leap. This is the principle of animation.

As a man became more learned, the stages of a wrestling match were formed into an Egyptian mural, enabling the viewer to shift his vision from one action to the next, experiencing the activity and progress of the match. The Greeks used a similar technique in decorating their pottery or urns. By rotating the urn while focusing the eye on a given spot, the succession of animated drawings gave the viewer a sense of motion.

However, pictures did not actually move until 1831, when Joseph Plateau, a Frenchman, made the first animated cartoon. He drew fourteen stages of an action on a disc and mounted it on a shaft with another disc into which were cut a series of slits. When both discs were revolved, the viewer, by peering through the slits, was given an illusion of motion. This device was called the "phenakistoscope."

In 1834, William Horner invented "The Wheel of the Devil," applying the same principles as Plateau's to a shallow cylinder. Then came the "zoetrope" or "daedalum" from the imaginative mind of Desvignes in 1860. This was a shallow drum-shaped device into which strips of pictures portraying a simple action such as a child jumping rope, or a man pumping water could be interchanged, giving the viewer a variety of brief performances.

With his *Theatre of the Projected Praxinoscope*, Emile Reynaud of France emerged in 1877 as the first man to attempt to project a series of action drawings upon a screen. By means of carbon lights, mirrors and revolving drums that contained hand-colored pictures, he gave many successful fifteen-minute performances, accompanied by appropriate mood music.

With the invention of the Kinetoscope of Thomas Alva Edison in 1891, the old order of things was brought to a close and a new era began—that of the motion picture camera. The whole scale was changed and the animated cartoon as a recognized form of public entertainment came into being.

In 1906, J. Stuart Blackton produced the first cartoon on motion picture film for Vitagraph. It proved quite popular with the audiences of that period. Many artists in America and Europe began working on animated subjects; so many in fact, that the actual order of their accomplishment would be almost impossible to record with accuracy.

Winsor McCay, of the *New York Journal*, put his newspaper character, Little Nemo, into animation in 1911. His *Mosquito* picture followed, and then *Gertie, the Dinosaur*, which he formed into a vaudeville act. Touring with the picture, McCay would give orders from the stage which were obeyed by Gertie on the screen. The act was a sensation.

Earl Hurd, another cartoonist, invented the modern cartoon technique by tracing the moving parts of his characters on celluloid sheets and photographing them over opaque backgrounds. This eliminated the need of re-drawing the entire background and characters for every frame of film. Many first-rate artists were attracted to this field, but the lack of sufficient monetary return gradually set them back to more lucrative art work. During the early 1920's the novelty of animated cartoons began to wane. They had developed a sameness due largely to low-budget quantity production. Cartoons no longer seemed inspired and became a relatively unimportant part of the motion picture industry.

I had begun making cartoons in Kansas City in 1921. Joining my brother, Roy, in Hollywood in 1923, we were not content to follow the usual trend, and *Alice in Cartoonland* cartoons combined live-action with pen and ink animation. These were followed by the successful *Oswald, the Lucky Rabbit* series.

Sound had just made its dramatic entrance into motion pictures when I created Mickey Mouse. Always eager for new tools and novelty, I saw that sound synchronized to animation would arouse new interest in cartoons. When *Steamboat Willie*, the first Mickey Mouse with sound, opened at the Colony Theatre, New York City, on September 19, 1928, a new star was born. The whole world took Mickey to its heart and in a few years he had become the screen's most famous personality.

The Skeleton Dance, released in 1929, marked the first *Silly Symphony*. This popular series gave us a much wider field to work in—fantasy, fable, a host of new characters, a new world of dreams in which music and the lyric mood were emphasized.

The little Disney Studio became a school in which both novices and veterans put the art of animation under the microscope of intelligent analysis. For the first time in the medium's history, every foot of animation was criticized and re-drawn endless times. The men became perfectionists and the Disney characters began to move like live things, to take on personalities, to act. Time and money did not matter—only quality. We were building a strong foundation for the future.

The early cartoon-makers were hampered in an orderly preparation of stories because of the nature of their medium. The written script used for live-action filming couldn't convey the swift action and fantastic effects that could be achieved in cartoons. A need for a better mode of presenting cartoon stories was felt. When the Disney Studio was bursting forth with creativity in the early thirties, the first storyboard was born. Today it is standard procedure in the cartoon industry.

The storyboard is ideally suited to cartoon making. It tells the story graphically, exactly as the camera's eye will see it, and is also flexible. Changes in the story line can be made by merely unpinning sketches and substituting others or even changing the sequence of the boards. The boards show pace, movement, excitement.

Sixty boards generally comprise a board. No attempt is made at art. The sketches are made boldly, so they can be read across a room. Usually they are done with black pencil or charcoal since color can give the board a jumbled appearance. However, color is occasionally used to suggest a mood or illustrate a costume.

With its many sketches underlined with strips of paper containing the dialogue or musical lyrics, the boards take on the appearance of a comic strip. Three storyboards can usually tell a short subject. A feature requires twenty-five or more. When the story is complete, the boards are photographed and photostatic blow-ups are distributed to all the artists working on the production.

Preparing a story for a cartoon feature is a long and tedious process. It begins in my mind with the conception for an animated feature. It may be a fairy tale I have known since childhood, a book that is on the market or the fragment of an idea. On telling my idea to the story men, I describe the basic plot and theme of the story. Then the work begins of fashioning that story into screen entertainment that will engross, amuse and move audiences throughout the world. A team of two or three story men begins work on an outline and then the storyboards. Repeated conferences are held with me so I can follow each turn of the plot, contributing creatively.

Aside from the basic plot line, the story men are also concerned with locale and period. Once this is established a tremendous amount of research is required to determine the correct architecture, furnishings, props, and costumes to be used. The studio librarians and researchers go to work, contacting museums, scouring libraries for photographs and old prints, descriptive literature, ancient manuscripts, anything that might aid the story men and artists in capturing the true flavor and authenticity of medieval Europe. The results of their findings help simplify the work

of the story men and artists and contribute to the over-all beauty and striking realism of the completed production.

In the pioneering days of animation the motion picture cartoonist was his own story writer, gag man, director, layout man, animator and background artist. But as the industry grew more complex, the various operations involved in cartoon making had to be divided among the several creators or teams of creators. Layout is one of the important results of that diversification of duties and the layout man evolved as the creator who actually stages the scenes. He is responsible for how the picture looks, just as the art director decides the appearance of a live-action movie or a designer the appearance of a stage play.

The work of a layout man begins as soon as the director takes over a picture. He sits in on the story conference where he is concerned, contributing to that conference by his knowledge of the mechanics of staging. The layout man, because he must translate the fine talk of a story conference into scenes and layouts on paper, is often a balance wheel for the conference. He knows what can and cannot be done with drawings and a camera. Of course, he learns in the conference what is expected of the layout which he must make. That is, what part it will play in the story as a whole; what type of a set it will be, exterior or interior; what props must appear on it. As the layouts are finished and approved by the director, tracings of them are made and given to the animators. The animators are guided by this layout tracing in animating character movement in the scene.

After the animation is completed for a particular scene, and has been okayed by the director, it is checked against the actual layout for that scene. Withstanding this test, the layout goes to the background department to be traced and painted.

The director in live-action films has the ultimate responsibility for what takes place on the screen. He constructs the scene, tells the actors what to do and makes them do it until he is satisfied. He selects camera angles, chooses the proper lighting, paces the action, maneuvers the crowds. The animation director performs much the same function, but his problems are more complex. And while a live-action director may finish a picture in six weeks, the director of animation may remain on a feature for from three to six years. A director at the Disney Studio is in on the making of a cartoon feature from almost the beginning to the end. The selection of subject matter is initiated by me and the story department but the director is generally present when the first storyboards are prepared.

After the final storyboard conference, the director goes into action. It is now his job to get that story on the screen. He must determine how to stage each scene and although the storyboards help, they are concerned largely with telling the plot in general terms. The director must juggle the complex factors of camera angles, close-ups, longshots, etc., to tell the story smoothly, dramatically and humorously. He is aided by the story men, sketch artists and layout men.

The director and storymen order whatever songs, music and sound effects have to be pre-recorded. The director supervises the final setting of the characters' appearances by the sketch artists and animators. He oversees the selection of colors and backgrounds. And he hands the scenes out to the animators to begin animation.

When the color print has been assembled, the director must supervise the final composite sound track re-recorded. He must balance all the factors, assuring that the voices are clear, the sound effects well placed and the music rich. Only when the final recording is done and sent with the picture to the color lab for processing is the director's job completed.

The Disney Studio has become synonymous with the animated cartoon since we were the first to accept the challenge of perfecting the medium; the first to develop it to the degree which allowed the production of highly complex feature-length cartoons. But even with tremendous refinement, the animated cartoon today employs much the same methods as those used by us in the early days. There is no short cut. The animated cartoon requires a large amount of effort by a great many masters of a number of professions.

Responsible for the bulk of that effort are the more than 200 talented artists employed in the studio's animation department. Of these, approximately 50 are animators whose expert pencils bring the cartoon to life. The remainder are assistant animators, "breakdown men" and "inbetweeners" who assist the animators in producing the ideas and the staggering number of drawings necessary to complete a cartoon. Their work is assigned by a director who provides a complete explanation of the scene action and a pencilled sketch of the background against which the characters will move.

The dialogue for the characters has been pre-recorded and the recordings are given the animator. He also gets an exposure sheet which tells the length of the scene, the musical tempo, the dialogue continuity and a description of the scene. Then his work begins. The animator is often an accomplished actor as well as a good draftsman. These talents, together with an appreciation of good humor, a sense of good taste and timing and the ability to create entertaining situations, are demanded of the men who spend their lives drawing Disney characters.

Because the temperament, acting ability and artistic talent of each artist differs, an attempt is made to "cast" animators for certain cartoon characters. All are authorities on human and animal anatomy but some excel at creating beautiful young ladies like Cinderella, or such delightfully droll characters as the good fairies in *Sleeping Beauty*.

Creation of an entirely new character is often a laborious task. The animator must make many decisions before he touches the pencil to paper and begins the painstaking process by which his unique medium of enterment is born. Many of these problems are solved by the creation of a *character model sheet*. This chart contains a series of drawings of a particular character, showing her in various poses, moods and expressions. These are usually composed by the animator responsible for the creation of that character. All of the other artists involved in drawing the character will follow the model sheet to sustain the uniformity of the character throughout the many scenes of the production.

Finally getting down to the painstaking job of animation, the animator sketches out what he thinks the action and feeling of the scene should be. He makes the "extreme" drawings for a particular character and leaves the more routine detailed work to his crew of assistants. The rough animation is photographed in the animation "test" camera department and viewed by the animator and director on a movieola. If it meets their approval, the drawings are sent to cleanup, where the lines are put into final form. At last the animator's work is ready to be inked and painted and to become another small segment in the vast amount of art and labor that goes into an animated cartoon.

Colors in our features are not chosen with the simple ease of merchandising a postcard. They are the result of much study and discussion. Usually, between two and six combinations of colors are prepared for each sequence. The final decision is made by a group consisting of the director, layout man, background artist and color model supervisor. The latter is a member of the Ink and Paint Department who acts as liaison between the production unit and Ink and Paint, which is wholly feminine and employs over 200 girls. After the animator and his crew have finished their work on a given scene, the color model supervisor pulls out representative drawings. Consulting with the production unit, she makes exact tracings of the drawings on celluloid and creates the color combinations for the key characters. When the colors are chosen, the animation drawings are carefully checked and sent to the Ink and Paint Department. The supervisor hands out the bundles of drawings to the inkers, who copy the animator's penciled lines with careful strokes of ink on the sheets of celluloid.

In the paint lab, which resembles the drug dispensary of a large hospital, white-coated girls issue paints of every conceivable color. There are seventy main families of colors and more than six hundred different shades, all of which are processed right in the Disney Studio color laboratory. In the painting corridors, the girls follow the outlines that the inkers have made. The painters work with a set of ten cels at a time, painting them on the reverse side. Guided by color models, the painters use quick, sure strokes of the brush, bearing in mind that the thickness and consistency of paint must be the same on every cel.

After the painting has been completed, the cels are checked for accuracy and color by a supervisor in the Final Checking Department. They are then cleaned and sent along with the scene's background and exposure chart to the Camera Department for the final step in production. ♦

Some stories can best be told by all-cartoon. Animals which can be controlled, caricatured, exaggerated, are best for fable and morality tales—they have been since Aesop's day and before. But stories like KIDNAPPED *and* SWISS FAMILY ROBINSON, *which require the heroic myth, demand flesh and blood. The appropriate dignities and humanities can't be achieved by animal symbolism. I switch from one to the other for variety. My films have always maintained the highest standards of photographic excellence, beautiful color, sensitively selected music, artistic cutting and pacing, and subtle humor. I am tremendously in earnest about creating fine, clean, amusing drama for small and grown-up children and adults—a new kind of drama that makes the whole world kin.*—WALT DISNEY

THE LIVE-ACTION MOVIE WORLD OF WALT DISNEY

The motion picture has become one of the marvels of all time; a true Wonder of the World in its magical powers. But what it has wrought on the screen for every man and his family to see and ponder has been even more wonderful. The motion picture has become a necessity of life, a part of our balanced existence. The most important thing brought about in the past quarter century of motion picture history is the recognition that amusement, recreation, mass diversion, is no longer a dispensable luxury. Family fun is as necessary to modern living as a kitchen refrigerator. People are always going to demand and enjoy movies in the theater. Patronage will depend more than ever upon what we put on the screen. And especially on how we understand the needs and desires of our younger generation.

The inspirations of mind and spirit that go into the making of a Disney picture are not as mysterious as those of other creative efforts. My productions consist simply of the two essentials of good picture-making—one essential is clarity. The other is interest. If a subject is presented in a way that arouses a person's interest; if he is shown that it relates directly to his needs; if he is made eager to learn and learning becomes—as it can be—one of the keenest of pleasures; then he will learn far more readily and surely than if he is forced to drudge along under the whip of compulsion or duty. Failure to make clear the nature and meaning of the thing being produced is one of the surest causes of dullness and failure to learn. The success of my movies has sprung from their universal appeal. To achieve this I have had to learn to work in terms of the universal human emotions and experiences, of joy and fear and sadness, love of the strange, the grotesque, the incongruous. And I have had to learn to work with instant clarity.

So long as our film presentations touch the mind and warm the heart with the best the motion picture industry can offer in art and craftsmanship and genuine human warmth, so long may we expect a prosperous and long life ahead.—WALT DISNEY

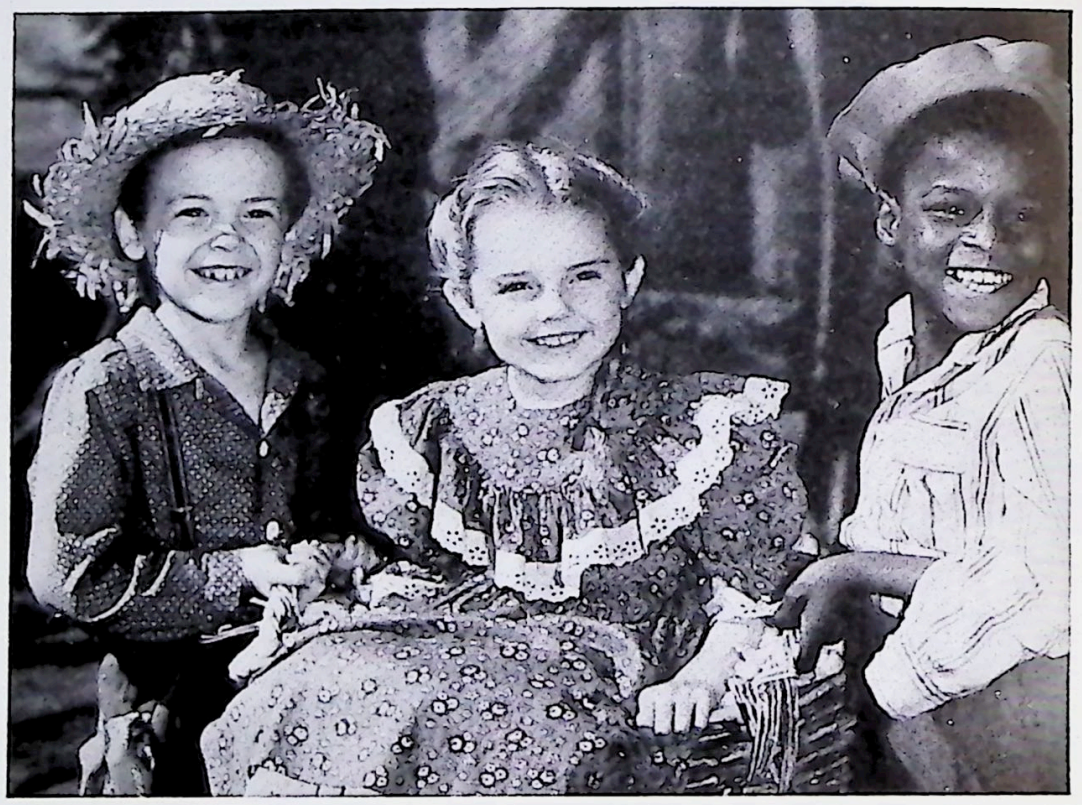
Swiss Family Robinson

Kidnapped

Tonka

The Story of Robin Hood

Treasure Island

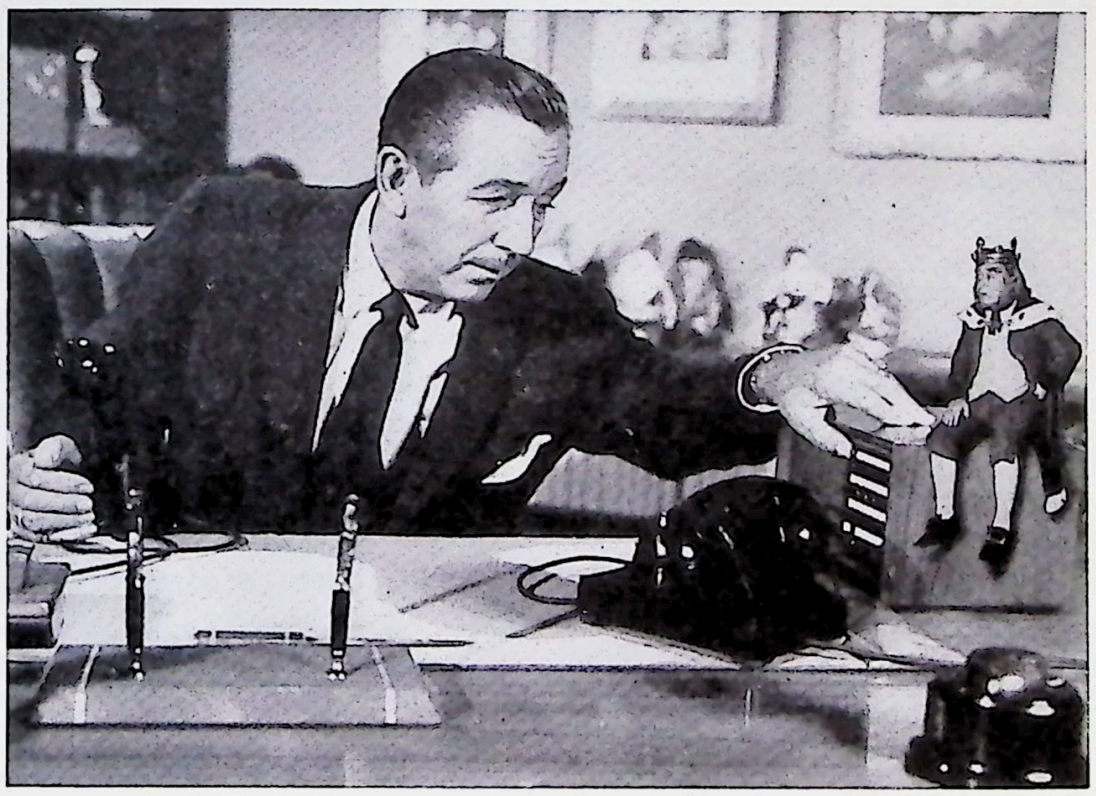


Song of the South

The Sword and the Rose

20,000 Leagues Under the Sea

Shaggy Dog



Darby O'Gill and the Little People

Third Man on the Mountain

Toby Tyler

Hayley Mills is Pollyanna as I envisioned her. In my opinion, this beautiful actress from London, England, is the finest young talent to come into the motion picture industry in the past twenty-five years. She is well on her way to becoming one of the screen world's greatest stars. —WALT DISNEY

POLLYANNA

produced by Walt Disney

WALT DISNEY'S new technicolor production, *Pollyanna,* starring Hayley Mills, daughter of famed English actor John Mills, is based on the popular and memorable American best-seller by Eleanor H. Porter. First published in 1912, this superb novel is conservatively estimated to have sold over three million copies. One million since World War II. It is still immensely popular abroad and continues to be read throughout the world.

David Swift, who wrote the dramatic screen play, adapted from the novel, also directed this enchanting motion picture which stars, in addition to Hayley Mills, who plays the title role, Jane Wyman, Richard Egan, Karl Malden, Nancy Olson, Adolph Menjou, Donald Crisp, Agnes Moorehead, and Kevin Corcoran. It is predicted that *Pollyanna,* Disney's greatest production to date, will attract the largest world-wide audience in the history of movie-making.

THE STORY: At the death of her father, a missionary in the West Indies, motherless 11-year-old Pollyanna comes to live with her wealthy Aunt Pollyanna Harrington in a small eastern town. Embittered by a broken love affair with Dr. Chilton, the lonely and loveless Aunt Polly gives the child little love or affection, relegates her to a mean attic room.

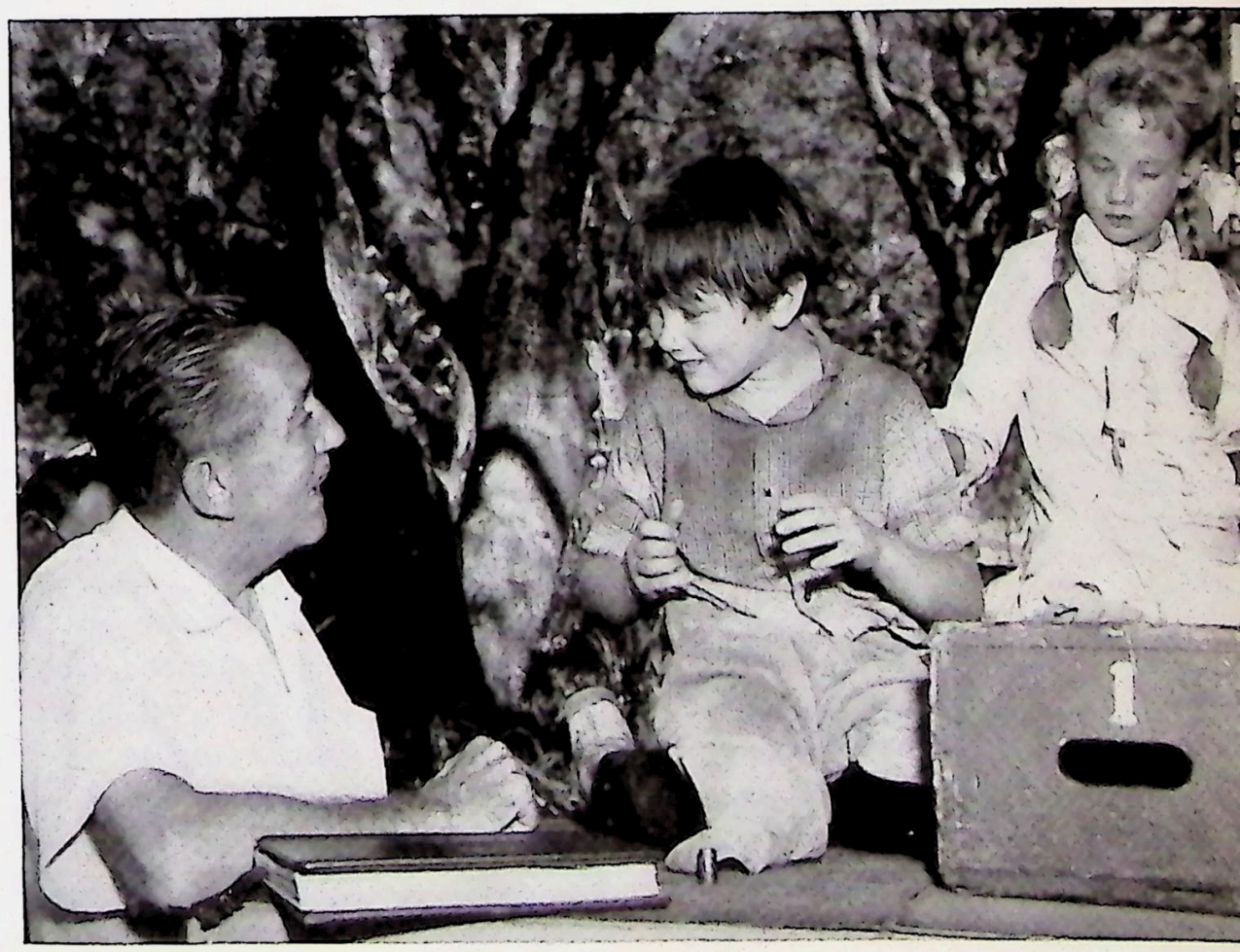
Pollyanna's father, however, has taught her to play the "glad" game, which involves finding something about which to be glad in all given situations, no matter how trying. Soon she has endeared herself to the servants as well as most of the townspeople, has them all imbued with her philosophy, including Mr. Prendergast, a wealthy recluse, who becomes interested in Jimmy Bean, a local orphan boy.

The economy of the town is dependent upon the Harrington wealth and Aunt Polly is undisputed leader of civic affairs; even has the Rev. Ford under her domination to the extent of dictating his sermon themes.

Dr. Chilton, visiting his uncle, Mayor Warren, lends aid when the archaic Harrington Orphanage catches fire. Mayor Warren spearheads a movement to build a new orphanage, but Aunt Polly vetoes the plan. The Mayor defies her, plans a bazaar to raise money, even though local business people are afraid to cooperate. Even Rev. Ford refuses support for fear of reprisals from Aunt Polly.

Pollyanna precipitates the turning point when she reminds Rev. Ford that although Aunt Polly may own the town, she doesn't own the church. Inspired by her story of her father's use of the Bible's "joyful" texts, he makes a public plea for the bazaar, assuring its success. Refused permission to attend, Pollyanna leaves her attic room via a huge tree, with the aid of Jimmy Bean. After a happy, carefree evening, she tries to climb back in but falls and sustains an injury which paralyzes both legs. Dr. Chilton advises a delicate operation but doubts its success unless Pollyanna is roused from her sudden apathy and despondency.

On the day of her departure for a city hospital, the entire town turns out to bring flowers and gifts, cheer her on. Pollyanna's depression vanishes as she is surrounded by well wishers and she learns that Jimmy Bean has been adopted by Mr. Prendergast, and now a chastened and devoted Aunt Polly and Dr. Chilton are reconciled. A happy and hopeful little girl boards the train. ♦



On the location set of "Pollyanna," Walt Disney discusses a scene with his young stars, Kevin Corcoran and Hayley Mills.

DISNEYLAND

The Fun and Fantasy Magic Kingdom of Walt Disney

DISNEYLAND, a 160-acre Magic Kingdom in Anaheim, California, near Los Angeles, designed and created by Walt Disney, has developed into a national institution that annually entices 5 million people of all ages from the world of reality into a land of "let's pretend." As a tourist attraction it is comparable to the nation's capital, and has surpassed the combined drawing power of Grand Canyon, Yellowstone and Yosemite National Parks. Its visitors include little children and people so elderly they arrive in wheel chairs; poor people, rich people, average people, distinguished and eminent people, princes, kings, queens, emperors and premiers. For every child among Disneyland visitors, there are four adults. What underlies its remarkable attainment, in a few short years, of the stature of a great international tourist attraction? What sparks does it set off to ignite people's imaginations? Here is Walt Disney's analysis in his own words:

Many of us fondly remember our "small home town" and its friendly way of life at the turn of the century. To me, this era represents an important part of our heritage and thus we have endeavored to recapture those years on Main Street, U.S.A. at Disneyland. Here is the America of 1890-1910, at the crossroads of an era, where the gas lamp is gradually being replaced by the electric lamp; the plodding, horse-drawn street car is giving way to the chugging "horseless carriage." America was in transition: the discoveries of the late 19th Century were beginning to affect our way of life. Main Street represents the typical small town in the early 1900's—the heartline of America. For those of us who remember those carefree times, Main Street will bring back happy memories. For our younger visitors, it is an adventure in turning back the clock to the days of grandfather's youth. When you visit the apothecary, the ice cream parlor, the market house and the exhibits which have been re-created from this bygone era, we hope you'll visualize, as I often do, your own home town's main street, or the one your parents and grandparents have told you about. And before leaving Main Street, many of you will want to board one of the Santa Fe and Disneyland railroad trains at the old-fashioned Main Street depot for a complete trip around Disneyland, including our new Grand Canyon diorama.

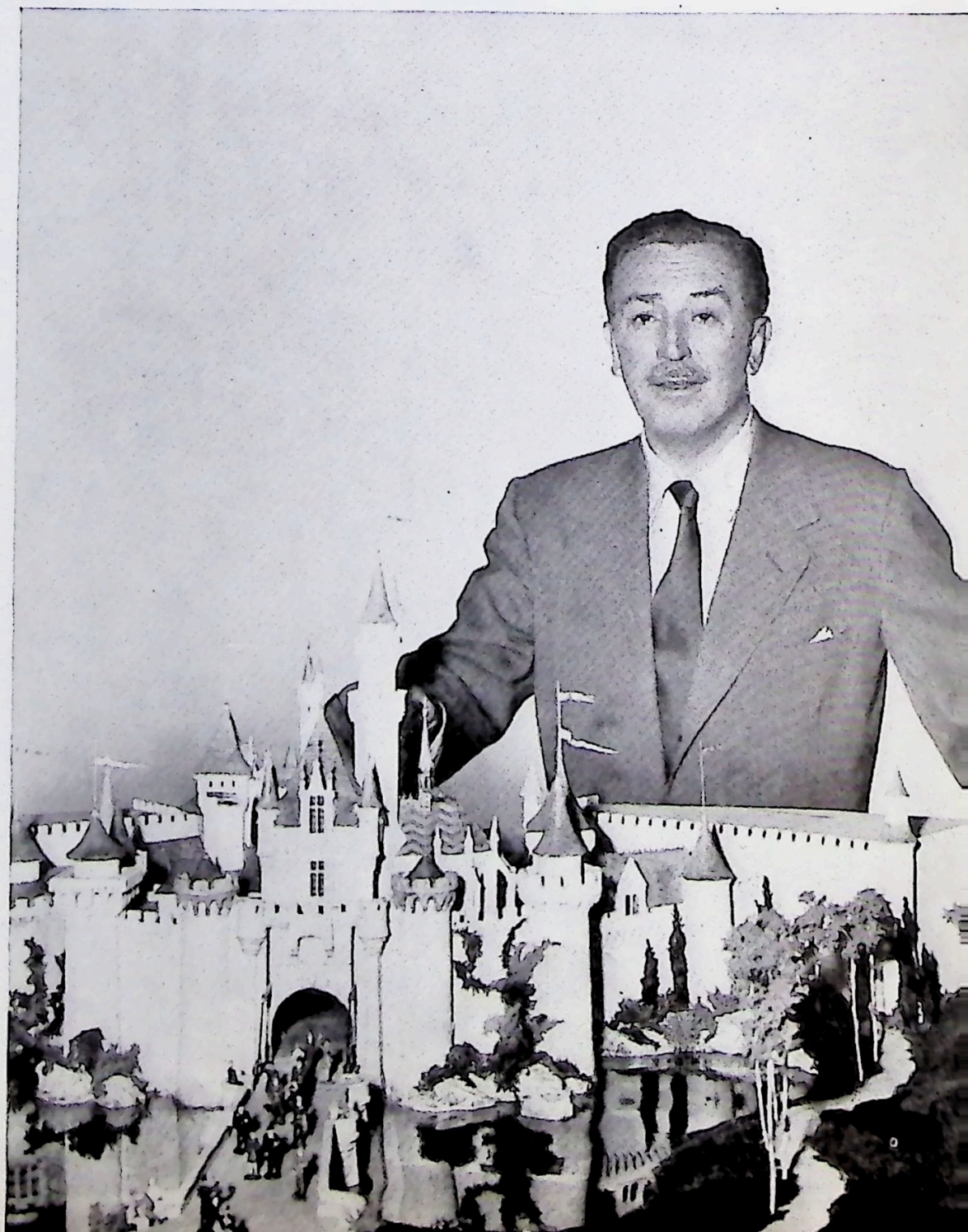
When we were planning Fantasyland, I recalled the lyrics of the song, "When You Wish Upon a Star." The words of that melody, from our picture "Pinnocchio," inspired us to create a land where dreams could actually "come true." In Fantasyland, those classic stories of childhood have become actual realities for you to participate in. Here in "the happiest kingdom of them all," you can journey with Snow White through the dark forests to the home of the seven Dwarfs; fly with Peter Pan from the clutches of Mr. Snee and Captain Hook; and race with Mr. Toad on his wild auto ride through Old London Town. There are many other happy adventures in Fantasyland, too. Through the Rabbit Hole, you'll find the nonsensical world of Alice in Wonderland; and Dumbo, the elephant with aerodynamic ears, will carry you on a flight high above Fantasyland. In colorful Dutch canal boats, you'll journey through Storybook Land to view the homes of the Three Little Pigs, Pinocchio's Village and Cinderella's dream castle.

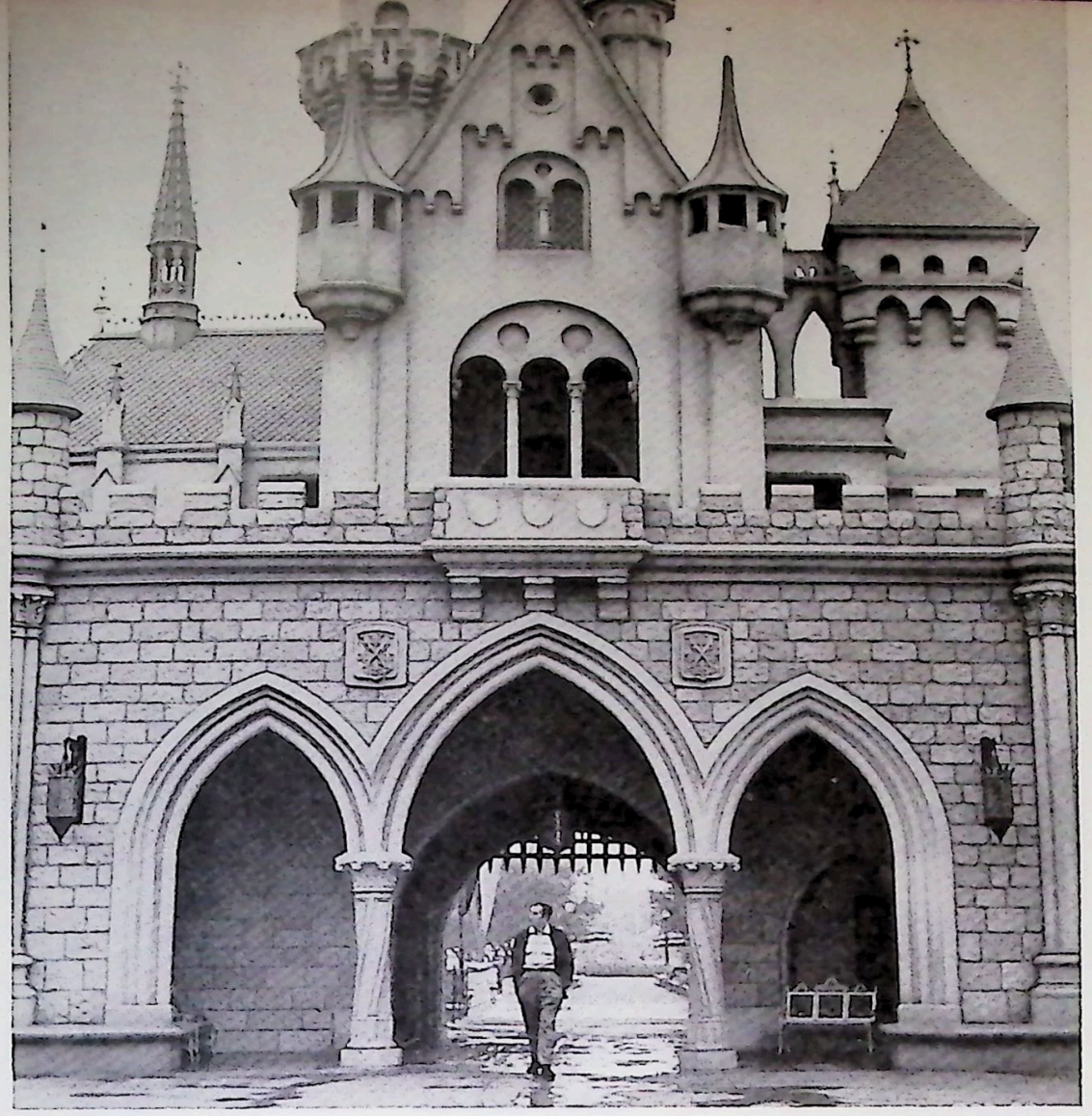
All of us, whether 10th generation or naturalized Americans, have cause to be proud of our country's history, shaped by the pioneering spirit of our forefathers. It is to those hardy pioneers, men and women of vision, faith and courage, that we have dedicated Frontierland. Here you can return to Frontier America, from the Revolutionary War era to the final taming of the Great Southwest. In Frontierland, you can journey down the Rivers of America aboard a Mississippi sternwheel steamboat for a glimpse of Mark Twain's America; laugh at the boisterous, rollicking floor show in the Golden Horseshoe "Saloon"; view the ghost town of Rainbow Ridge, typical of the mining towns in the old West; and float to Tom Sawyer Island aboard a Huck Finn raft to explore Injun Joe's Cave and old Fort Wilderness. Aboard a Conestoga Covered Wagon or stagecoach, you see the wonders of the Painted Desert, and the Rainbow Ridge Mine Train takes you deep into underground caverns abounding with multi-colored waterfalls. You can "book passage" for a voyage aboard the three masted sailing ship, the "Columbia," one of Frontierland's newest attractions.

Tomorrow can be a wonderful age. Our scientists today are opening the doors of the Atomic Age to achievements which will benefit our children and generations to come. In Tomorrowland, we've arranged a preview of some of these wonderful developments the future holds in store. You will actually experience what many of America's foremost men of science and industry predict for the world of tomorrow. Time moves forward to the year 1987. You board a rocket ship and "blast off" into outer space, leaving the earth far below in your journey through space towards your destination—the Moon. Nearby, on the Space Satellite, you'll see America from a space platform as it orbits around our globe. Most popular transportation in Tomorrowland is the Autopia Freeway of the Future, where youngsters of all ages drive real gasoline powered automobiles over the safest super highway in the world. You can also "break the sound barrier" in an Astrojet, or travel high above Disneyland on the lofty Skyway.

Everyone has a dream of traveling to mysterious far-off places, or exotic tropical regions of the world. To create a land which would make these dreams a reality, we pictured ourselves far from civilization, in the remote jungles of Asia and Africa. The result is Adventureland. In this "wonderland of nature's own design," you will find bright orchids, colorful flowers, tropical plantings and trees imported from the four corners of the world. Adventureland is also filled with "wild" animals and native "savages" who often display their hostility to your invasion of their jungle privacy. You enjoy all this on an explorer's boat cruise which carries you away from civilization on an exciting trip down mysterious jungle rivers. Adventure lurks at every bend in the winding rivers. There is the misty Amazon with its tropical rainforest; the murky Mekong River of Indochina; the dangerous hippopotamus-filled waters of the Belgian Congo; and the swirling rapids of the Nile.

—All these are Disneyland—the happiest place on earth. ♦





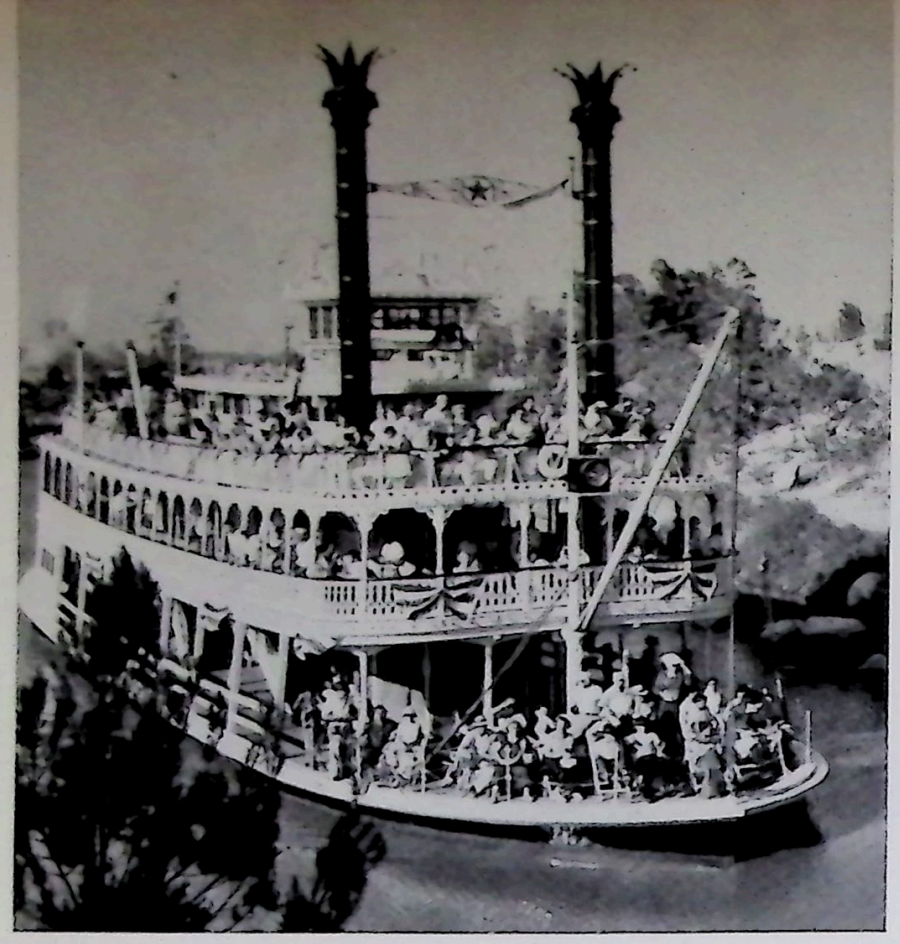
Walt Disney, surveying his dream come true, crosses the moat and drawbridge of Sleeping Beauty Castle, entrance to Fantasyland—"the happiest land of them all"—where classic stories of childhood become actual realities.

The way I see it, my park, Disneyland, will never be finished. It's something I can keep developing and adding to. A movie is different. Once I've wrapped it up and have turned it over to Technicolor to be processed, I'm through with it. As far as I'm concerned the picture I've finished a few weeks ago is done. There may be things in it I don't like, but if there are I can't do anything about them. I've always wanted to work on something alive, something that keeps growing. I've got that in Disneyland. Even the trees will grow and be more beautiful every year.—WALT DISNEY

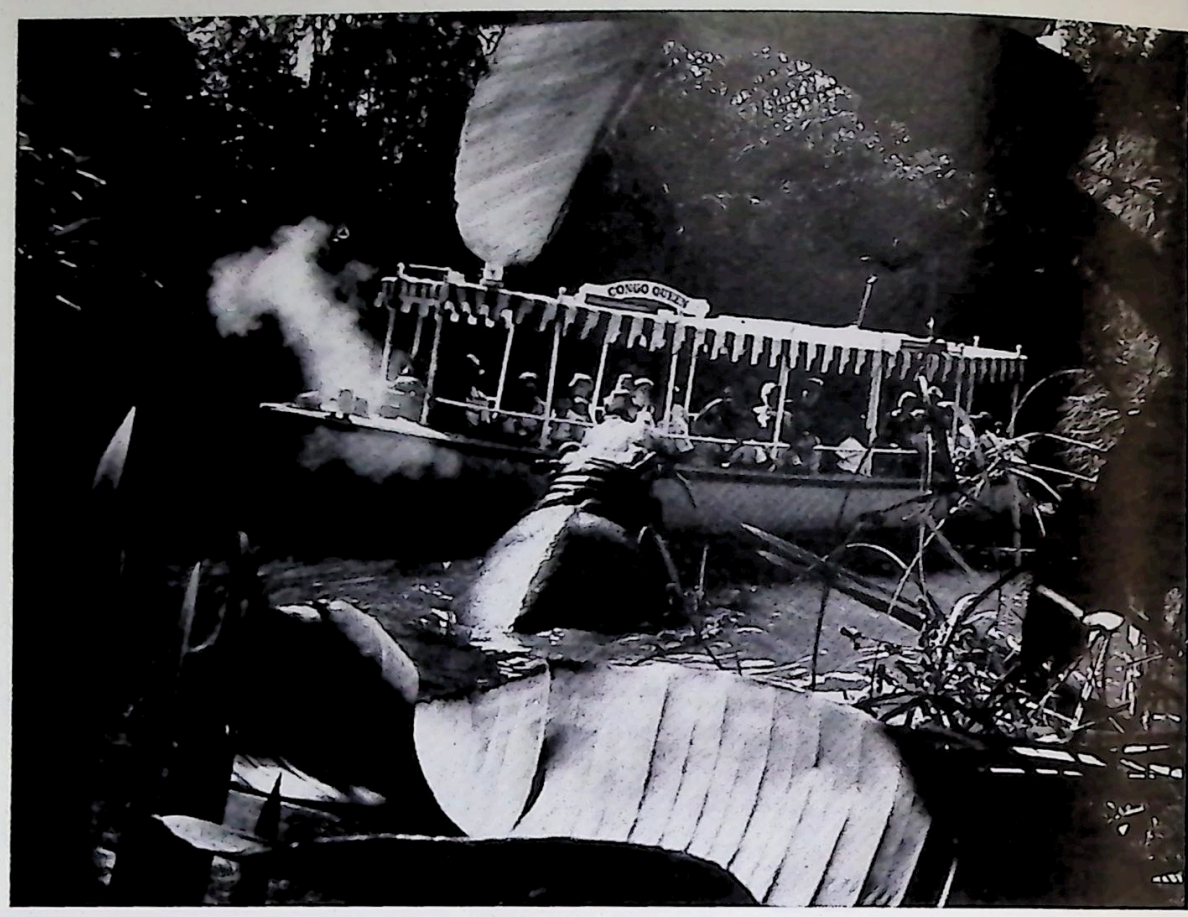
In the gay and carefree kingdom of Fantasyland dreams come true—for everyone who is young in heart—reliving storybook fantasies with Peter Pan, Alice in Wonderland, Snow White and the Seven Dwarfs, Sleeping Beauty, and many others.

Disneyland's brilliant "Fantasy in the Sky" fireworks burst over the Fantasyland Castle of Sleeping Beauty to the delight and amazement of throngs of visitors to the "Magic Kingdom" of fantasy, history, adventure and learning.

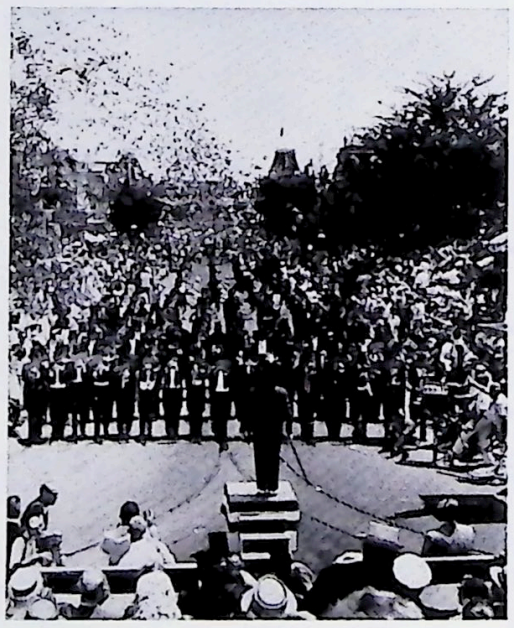
High above Disneyland between Tomorrowland and Fantasyland, the Skyway ride crosses caverns and ice grottos as the cable cars pass through the Matterhorn, an exact replica of the most famous mountain in the Swiss Alps.



Passengers on the stern-wheeler "Mark Twain" cruise the rivers of America, while other Frontierland visitors enjoy the floor show in the Golden Horseshoe "Saloon"; view ghost town of Rainbow Ridge; or float to Tom Sawyer Island aboard a Huck Finn raft.

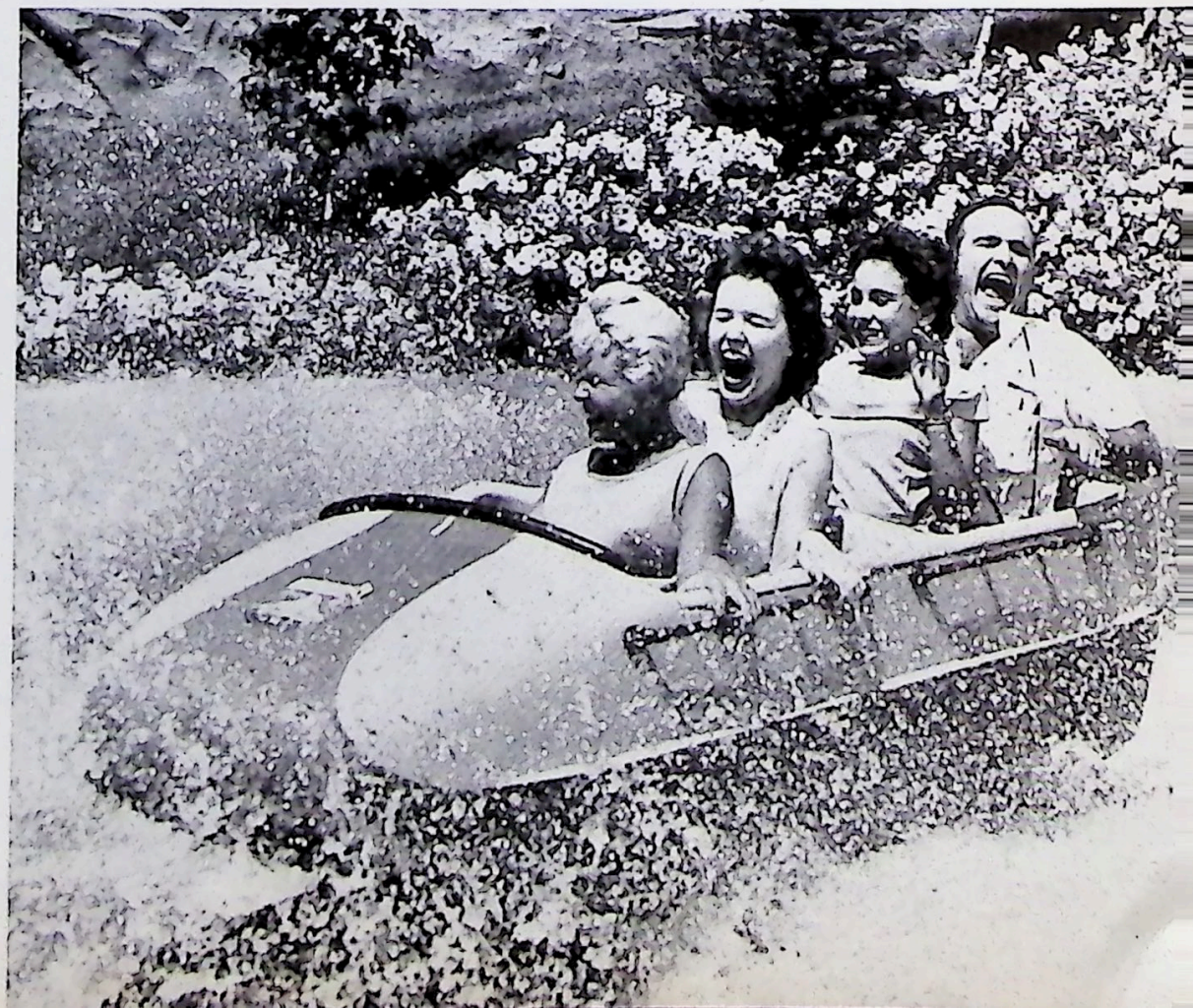


Visitors aboard the "Congo Queen," in the tropics of Adventureland, travel jungle rivers where native headhunters chant war cries as a boat approaches, and the guide fires a pistol at a charging hippo.

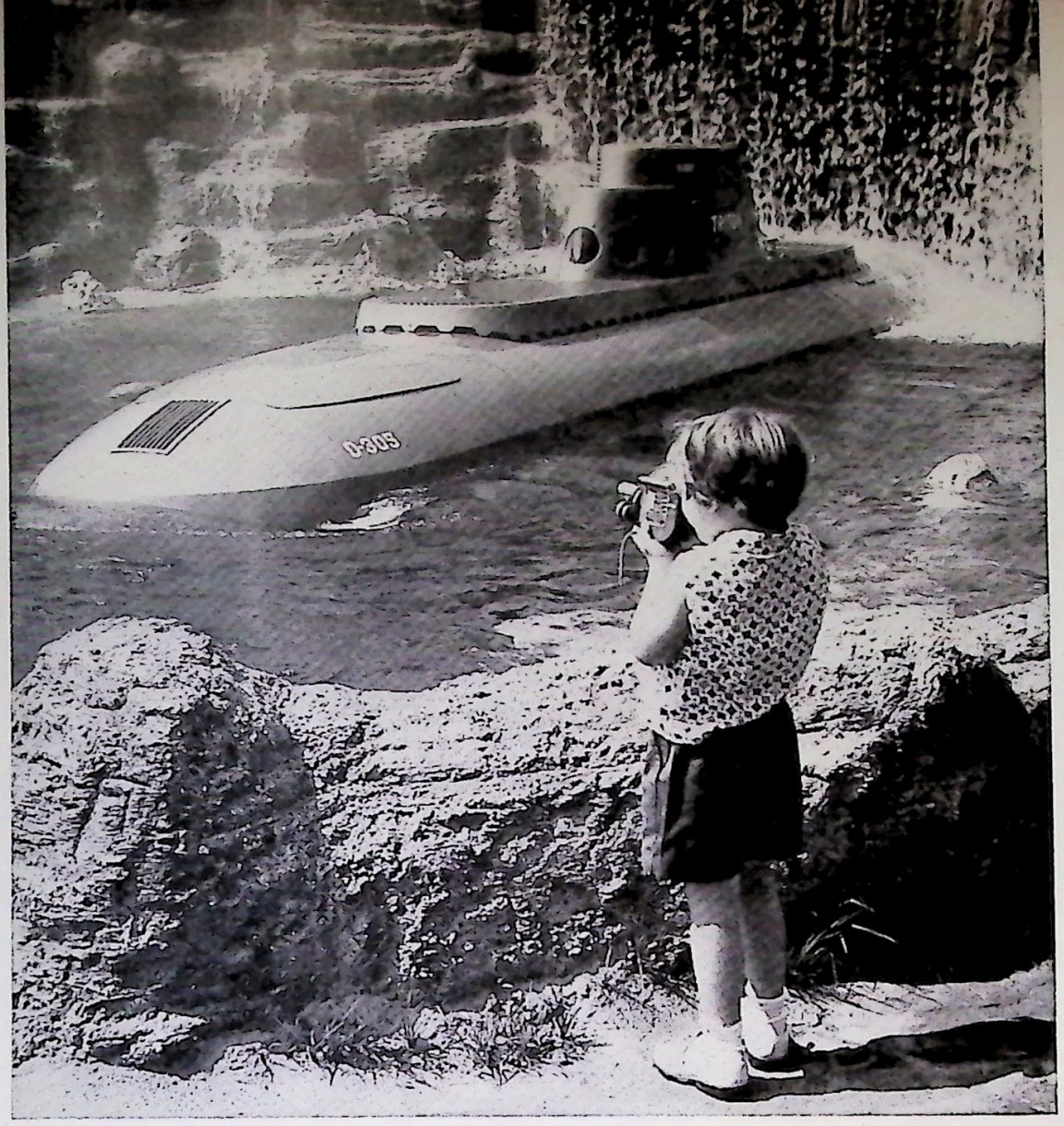


On Main Street, U.S.A., a typical "small home town" at the turn of the century, music of the Disneyland Band recalls happy memories of days gone by.

The three-masted sailing ship "Columbia," a replica of the original ship that made maritime history in 1790 as the first American vessel to sail around the world, carries passengers on a voyage up the navigable rivers of Frontierland.

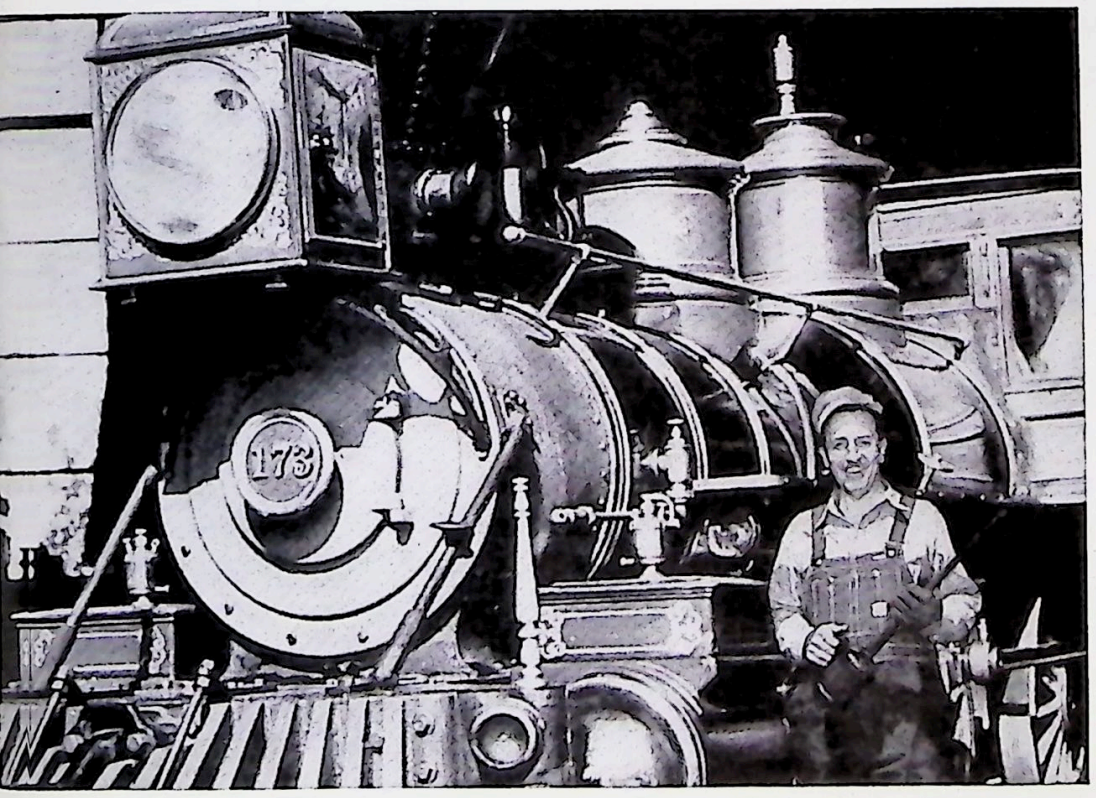


Racing down and around the "snow-capped" slopes of Disneyland's Matterhorn Mountain, and through Glacier Grotto inside the 14-story high replica, these bobsleds plunge to a halt at the bottom of the mountain in a "glacier lake."



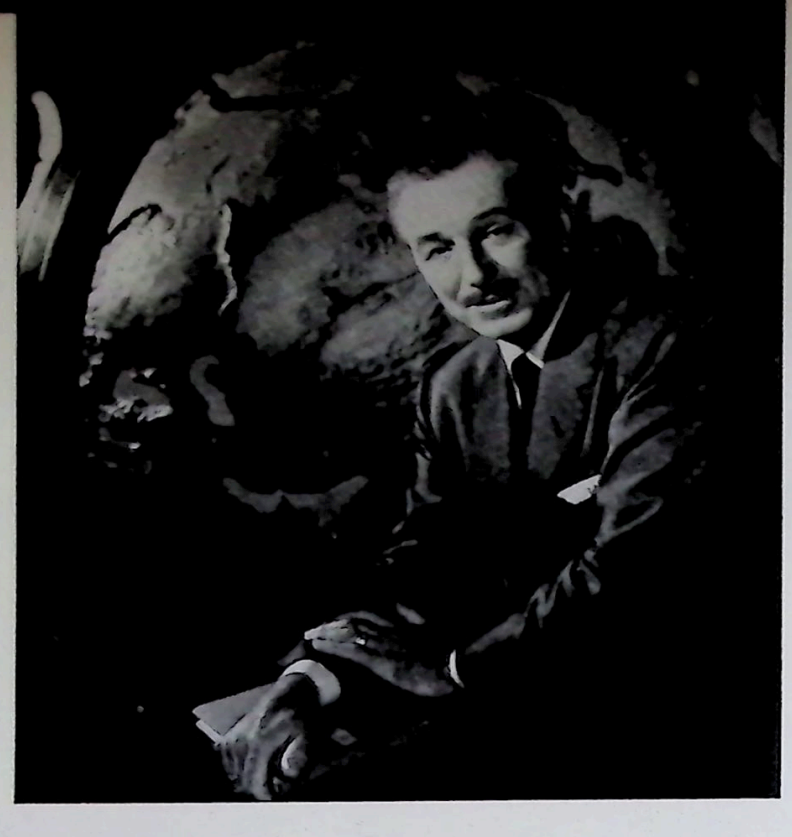
A fleet of 8 Disneyland submarines travel through a coral lagoon to the Lost Continent of Atlantis, the Graveyard of Sunken Ships and under the Polar Ice Cap.

Transporting Disneyland visitors over a concrete "highway in the sky," the first public passenger-carrying Monorail Train to operate daily in the United States was designed to demonstate a high-speed interurban transportation system.



Walt Disney inspects the steam locomotive of the Sante Fe & Disneyland Railroad. The train departs from the old-fashioned depot on Main Street for a trip around his Magic Kingdom and through the breathtaking Grand Canyon Diorama.

Admiring youngsters, autograph books in hand, crowd around the man who brought dreams and fantasy to life when he created Disneyland—where age relives fond memories of the past and youth may savor the challenge and promise of the future.



from the Wisdom of WALT DISNEY

I believe firmly in the efficacy of religion, in its powerful influence on a person's whole life. It helps immeasurably to meet the storm and stress of life and to keep you attuned to the Divine inspiration. Without inspiration, we would perish.

Most of my life I have done what I wanted to do. I have had fun on the job. I have never been able to confine that fun to office hours.

From years of experience I have learned what could legitimately be added to increase the thrills and delights of a fairy tale without violating the moral and meaning of the original. Audiences have confirmed this unmistakably. We define the heroines and heroes more vividly; add minor characters to help carry the story line; virtually create such immortal friends of the heroine as the Seven Dwarfs. Storywise, we sharpen the decisive triumph of good over evil with our variant knights—the issues which represent our moral ideals. We do it in a romantic fashion, easily comprehended by children. In this respect moving pictures are more potent than volumes of familiar words in books.

I am not influenced by the techniques or fashions of any other motion picture company.

Sheer animated fantasy is still my first and deepest production impulse. The fable is the best story-telling device ever conceived, and the screen is its best medium. A[illegible], of course, animal characters have always been the personnel of fable; animals through which the foibles as well as the virtues of humans can best and most hilariously be reflected.

Faith I have, in myself, in humanity, in the worthwhileness of the pursuits in entertainment for the masses. But *wide-awake*, not *blind faith*, moves me. My operations are based on experience, thoughtful observation and warm fellowship with my neighbors at home and around the world.

I don't pretend to know anything about art. I make pictures for entertainment, and then the professors tell me what they mean.

The screen has too long been confined to what we can see and hear, what the camera can show . . . things which reveal not the half of a man's life and his most intense interests, with live actors attempting to interpret the unseen—the emotions, the impulses of the mind. And doing it, we must admit, rather clumsily most of the time. Relying largely on words, often almost meaningless. Now, with the animated cartoon, we have another perfected tool—another scope—for getting at the inner nature of things and projecting them for the eye and the ear.

Films stimulate children to read books on many subjects.

I am interested in entertaining people, in bringing pleasure, particularly laughter, to others, rather than being concerned with "expressing" myself with obscure creative impressions.

I take great pride in the artistic development of cartoons. Our characters are made to go through emotions which a few short years ago would have seemed impossible to secure with a cartoon character. Some of the action produced in the finished cartoon of today is more graceful than anything possible for a human to do.

In learning the art of storytelling by animation, I have discovered that language has an anatomy. Every spoken word, whether uttered by a living person or by a cartoon character, has its facial grimace, emphasizing the meaning.

To captivate our varied and worldwide audience of all ages, the nature and treatment of the fairly tale, the legend, the myth, has to be elementally simple. Good and evil, the antagonists of all great drama in some guise, must be believably personalized. The moral ideals common to all humanity must be upheld. The victories must not be too easy. Strife to test valor is still and always will be the basic ingredient of the animated tale as of all screen entertainments.

We allow no geniuses around our studio.

I think we have made the fairy tale fashionable again. That is, our own blend of theatrical mythology. The fairy tale of film—created with the magic of animation—is the modern equivalent of the great parables of the Middle Ages. Creation is the word. Not adaptation. Not version. We can translate the ancient fairy tale into its modern equivalent without losing its lovely patina and the savor of its once-upon-a-time quality. I think our films have brought new adult respect for the fairy tale. We have proved that this age-old kind of entertainment based on the classic fairy-tale recognizes no young, no old.

The motion picture has become a necessity of life, a part of our balanced existence. It is not a negligible luxury. People are always going to demand and enjoy movies in the theatre. Patronage will depend more than ever upon what we put on the screen. And especially on how we understand the needs and desires of our younger customers. For their favor we must compete as never before.

Deeds rather than words express my concept of the part religion should play in everyday life. I have watched constantly that in our work the highest moral and spiritual standards are upheld, whether my productions deal with fable or with stories of living action.

The motion picture still has great things ahead. Equipped with its big screens, its color and sound fidelities and all its perfected devices for illusionment, nothing is beyond its range and powers. Itself a marvel of science, it can and will serve with equal facility the space enthusiast looking beyond the sun, and the homebody content with the warm familiar earth and all its bounties when he goes with his family seeking entertainment and inspiration.

The motion picture has become one of the marvels of all time; a true Wonder of the World in its magical powers. But what it has wrought on the screen for every man and his family to see and ponder has been even more wonderful.

I have a great love of animals and laughter.

Fantasy, if it's really convincing, can't become dated, for the simple reason that it represents a flight into a dimension that lies beyond the reach of time. In this new dimension, whatever it is, nothing corrodes or gets run down at the heel, or gets to look ridiculous like, say, the celluloid collar or the bustle. And nobody gets any older.

Fable animals are not real animals. They are human beings in the guise of bird and beast. From his earliest beginnings, as his cave drawings eloquently attest, man has been telling many of his experiences and dramatic conclusions and comments through animal symbols.

Why do animals dominate animated cartoons? Because their reaction to any kind of stimulus is expressed physically. Often the entire body comes into play. Take a joyful dog. His tail wags, his torso wiggles, his ears flap. He may greet you by jumping on your lap or by making the circuit of the room, not missing a chair or a divan. He keeps barking, and that's a form of physical expression, too; he stretches his big mouth. But how does a human being react to a stimulus? He's lost the sense of play he once had and he inhibits physical expression. He is the victim of a civilization whose ideal is the unbotherable, poker-faced man and the attractive, unruffled woman. Even the gestures get to be calculated. They call it poise. The spontaneity of the animal—you find it in small children, but it's gradually trained out of them.

If I were a fatalist, or a mystic, which I decidedly am not, it might be appropriate to say I believe in my lucky star. But I reject "luck"—I feel every person creates his own "determinism" by discovering his best aptitudes and following them undeviatingly.

Animals have personalities like people and must be studied.

Man is an animal as well as a creature with a soul. He has many things in common with his lesser brothers. In fact, he is the funniest, the most pathetic of all the animals. It is from this viewpoint that we have contrived all the comedy and blunderous behavior of our animal characters and fables from the birth of Mickey Mouse and the antics of Donald Duck to and through our feature fantasies.

Women are the best judges of anything we turn out. Their taste is very important. They are the theater-goers, they are the ones who drag the men in. If the women like it, to heck with the men.

We learned a great deal during the war years when we were making instruction and technological films in which abstract and obscure things had to be made plain and quickly and exactly applicable to the men in the military services. These explorations and efficiencies of our cartoon medium must not be unused and extended in the entertainment field.

Our pictures are as close to scientific truth as possible. But occasionally a minor point is yielded for the sake of drama or clarity.

Literary versions of old fairy tales are usually thin and briefly told. They must be expanded and embellished to meet the requirements of theater playing time, and the common enjoyment of all members of movie-going families. The screen version must perceive and emphasize the basic moral intent and the values upon which every great persistent fairy tale is found. To these ends I have devoted my own best efforts and the talents of my organization, in full realization of our responsibility as a mass entertainer and especially our responsibility to our vast audience of children around the world.

Public taste in amusement has changed very decidedly since the early days when the motion picture was a toy, a novelty; it has changed as much in animation as in live action cinema offerings.

I do not make pictures for children, at least not just for children. I won't play down to them. Too many people grow up. That's the real trouble with the world, too many people grow up. They forget. They don't remember what it's like to be twelve years old. They patronize; they treat children as inferiors. I won't do that. I'll temper a story, yes. But I won't play down, and I won't patronize.

The secret of juggling many responsibilities is organization. Key men are responsible to me and constantly in touch with me to see that I'm there at the right time. These administrators keep things running.

Animation is different from other parts. Its language is the language of caricature. Our most difficult job was to develop the cartoon's unnatural but seemingly natural anatomy for humans and animals.

Fantasy and reality often overlap.

I rely completely on personal enterprise and team effort. But I ride in the common stream of social life; my tastes are gregarious; there is nothing of the freakish or the "genius" about me personally or in the way I operate. I'm a conservative citizen.

It's the story that appeals to me and the manner of treatment is dictated from that.

Picture audiences want to know things rather than escape realities, so long as they are presented as entertainment. There now is such passion for learning as has never before swept this country and the world.

If anybody gets highbrow around the studio—out he goes.

from the Wisdom of WALT DISNEY

Art was always a means to an end with me. You get an idea, and you just can't wait. Once you're started, then you're in there with the punches flying. There's plenty of trouble, but you can take it. You can't back out. It gets you down once in a while, but it's exciting. Our whole business is exciting.

If I can't feel a theme, I can't make a film anyone else will feel. I can't laugh at intellectual humor. I'm just corny enough to like to have a story hit me over the heart.

Man needs a new set of problems to pull his mind away from old ones.

We have created characters and animated them in the dimension of depth, revealing through them to our perturbed world that the things we have in common far outnumber and outweigh those that divide us.

Music has always had a prominent part in all our products, from the early cartoon days. So much so, in fact, that I cannot think of the pictorial story without thinking about the complementary music which will fulfill it. Often the musical theme comes first, suggesting a way of treatment. This was the case with the Tchaikovsky music for *Sleeping Beauty* which finally formulated our presentation of the classic. I have had no formal musical training. But by long experience and by strong personal leaning, the selection of musical themes, original or adapted, we were guided to wide audience acceptance. Credit for the memorable songs and scores must of course go to the brilliant composers and musicians who have been associated with me through the years.

I try to build a full personality for each of our cartoon characters—to make them personalities.

For a child, encouragement from a grown-up can be a thrilling thing with lasting consequence. It can help fix his objectives, give him confidence to drive unswervingly toward his goal, spell the difference between failure and success.

People who have worked with me say I am "innocence in action." They say I have the innocence and unself-consciousness of a child. Maybe I have. I still look at the world with uncontaminated wonder, and with all living things I have a terrific sympathy. It was the most natural thing in the world for me to imagine that mice and squirrels might have feelings just like mine.

The era we are living in today is a dream coming true.

Humanity, as history informs us, changes very slowly in character and basic interests. People need play as much as they need toil. They never cease to be fascinated by their own powers and passions, their base or noble emotions, their faiths and struggles and triumphs against handicap—all the things that make them laugh and weep and comfort one another in love and sacrifice out of the depths of their being.

I am not trying to be a teacher. I want to make stories to apply to a broad field, so that mother and father can understand the need and will help the child. If we can accomplish that our work has been worthwhile.

The age we're living in is the most extraordinary the world has ever seen. There are whole new concepts of things, and we now have the tools to change these concepts into realities. We're moving forward. In terms of my work, I believe people want to know about this universe that keeps unfolding before them. But let's be clear about one thing—I'm not trying to teach anything to anybody. I want to entertain the public.

The story—the material we put on the screen—is still paramount. Nothing will take its place.

To think six years ahead—even two or three—in this business of making animated cartoon features it takes calculated risk and much more than blind faith in the future of theatrical motion pictures. I see motion pictures as a family founded institution closely related to the life and labors of millions of people. Entertainment such as our business provides has become a necessity, not a luxury. Curiously, it is the part which offers us the greatest reassurance about the future in the animation field. Fantasy, when properly done in the one medium best adapted to its nature, need never stale for the family taste.

You'll be a poorer person all your life if you don't know some of the great stories and the great poems. But the actual world of nature and human nature is where you will live and work with your neighbors and your competitors. So keep your eyes open.

Movie makers are often too introverted about their production. They tend to build up myths about audiences and to prattle glibly about shifting public taste and its unpredictables. In considering audiences and our professional function, remember one thing: Americans are a sociable folk, we like to enjoy ourselves in crowds, at sports arenas, at picnics, fairs and carnivals, at concerts and at the theater. Above all, we like to laugh together—even at our own shortcomings. I don't like to kid myself about the intelligence and taste of audiences. They are made up of my neighbors, people I know and meet every day. Folks I trade with, go to church with, vote with, compete in business with, help build and preserve a nation with.

All cartoon animals must be judged by their story intent and relationship as a matter of basic procedure in creating animation entertainment. Cartoon animals, of course, are not and never were replicas of real animals; they are a special breed of creatures out of the world of fable who duplicate human traits and foibles rather than those of the real animal kingdom. Mickey Mouse was never a mouse nor anything like a mouse; no more was Donald ever a duck.

All cartoon characters and fables must be exaggeration, caricatures. It is the very nature of fantasy and fable.

The inspirations of mind and spirit that go into the making of a Disney picture are not as mysterious as those of other creative efforts. Our productions consist simply of the two essentials of good picture-making—one essential is clarity. The other is interest. If a subject is presented in a way that arouses a person's interest; if he is shown that it relates directly to his needs; if he is made eager to learn and learning becomes—as it can be—one of the keenest of pleasures; then he will learn far more readily and surely than if he is forced to drudge along under the whip of compulsion or duty. Failure to make clear the nature and meaning of the thing being produced is one of the surest causes of dullness and failure to learn. The success of our movies has sprung from their universal appeal to millions of people of all nations, all ages, all degrees of experience, intelligence, and learning.

The way to get started is to quit talking and begin doing.

The way to keep children out of trouble is to keep them interested in things. Lecturing to children is no answer to delinquency. Preaching won't keep kids out of trouble. But keeping their minds occupied will.

Somehow I can't believe there are many heights that can't be scaled by a man who knows the secret of making dreams come true. This special secret, it seems to me, can be summarized in four C's. They are Curiosity, Confidence, Courage and Constancy, and the greatest of these is Confidence. When you believe a thing, believe it all over, implicitly and unquestioningly.

All you've got to do is own up to your ignorance honestly, and you'll find people who are eager to fill your head with information.

I believe in being an innovator.

Money is something I understand only vaguely, and think about only when I don't have enough to finance my current enthusiasm, whatever it may be. All I know about money is that I have to have it to do things. I don't want to bank my dividends. I'd rather keep that money working. I regard it as a moral obligation to pay back borrowed money. When I make a profit, I don't squander it or hide it away; I immediately plow it back into a fresh project. I have little respect for money as such, regard it merely as a medium for financing new ideas. I neither wish nor intend to amass a personal fortune. Money—or, rather, the lack of it to carry out my ideas—may worry me, but it does not excite me. Ideas excite me.

Every child is born blessed with a vivid imagination. But just as a muscle grows flabby with disuse so the bright imagination of a child pales in later years if he ceases to exercise it.

When youngsters get into serious trouble it is generally the parents who are delinquent, not the children. If you will look a little deeper, when some unpleasant incident occurs, you'll find that there's usually something wrong in the domestic menage. In too many cases the parents are the ones who are in trouble, and the parents are the ones who need help.

In order to make good in your chosen task, it's important to have someone you want to do it *for*. The greatest moments in life are not concerned with selfish achievements but rather with the things we do for the people we love and esteem, and whose regard we need.

Children are more intelligent today because their experience is greater. Exposure and schools are better. They have access to visual education in the schools. The imagination of the teacher is supplemented by the best visual aids. She in turn is stimulated and gets as much out of the films as the student does.

The cartoon is a good medium to stimulate interest. It is an ideal medium for teaching and it has always been my hope that we could do something that way. But it would have to be of general interest, yet helpful in teaching. It should be used for opening people's minds and meeting their needs. We have recently explained mathematics in a film and in that way excited public interest in this very important subject. *Donald in Mathmagic Land* stimulated interest in mathematics and turned out very well.

There are fashions in reading, even in thinking. You don't have to follow them unless you want to. On the other hand, watch out! Don't stick too closely to your favorite subject. That would keep you from adventuring into other fields. It's silly to build a wall around your interests.

There is more treasure in books than in all the pirates' loot on Treasure Island and at the bottom of the Spanish Main . . . and best of all, you can enjoy these riches every day of your life.

The American child is a highly intelligent human being—characteristically sensitive, humorous, openminded, eager to learn, and has a strong sense of excitement, energy and healthy curiosity about the world in which he lives. Lucky indeed is the grownup who manages to carry these same characteristics over into his adult life. It usually makes for a happy and successful individual.

People often ask me if I know the secret of success, and if I could tell others how to make their dreams come true. My answer is, you do it by working.

People still think of me as a cartoonist, but the only thing I lift a pen or pencil for these days is to sign a contract, a check, or an autograph.

Never get bored or cynical. Yesterday is a thing of the past.

People sort of live in the dark about things. A lot of young people think the future is closed to them, that everything has been done. This is not so. There are still plenty of avenues to be explored.

It is good to have a failure while you're young because it teaches you so much. For one thing it makes you aware that such a thing can happen to anybody, and once you've lived through the worst, you're never quite as vulnerable afterward.

From the Wisdom of WALT DISNEY

In bad times and good, I have never lost my sense of humor or my zest for life.

My business is making people, especially children, happy. I have dedicated much of my time to a study of the problems of children.

Everyone needs deadlines. Even the beavers. They loaf around all summer, but when they are faced with the winter deadline, they work like fury. If we didn't have deadlines, we'd stagnate.

Why worry? If you've done the very best you can, worrying won't make it any better. I worry about many things, but not about water over the dam.

Our schools should put more emphasis on how to go about finding out.

I'm not the perfectionist any more. It's my staff. They're the ones always insisting on doing something better and better. I'm the fellow trying to hurry them to finish before they spoil a job. You can overwork drawing or writing and lose the spontaneity.

Humans learned life's lessons by seeing real things or pictures with their eyes for ages before they began learning through written or spoken words, so it is not strange that they still learn most readily by pictures. The animated cartoon can set forth anything from a world in evolution to the whirl of electrons invisible to human eyes; can produce a mosquito tall enough to tower over a village or a fairy small enough to dance on a leaf; can make a mouse talk and an elephant fly, and bring a puppet to life; can get inside a complex machine, slow down its action, explain its operation to apprentices with a clarity impossible in any other medium, and can even get inside the human body.

Crowded classrooms and half-day sessions are a tragic waste of our greatest national resource—the minds of our children.

I didn't treat my youngsters like frail flowers, and I think no parent should. Children are people, and they should have to reach to learn about things, to understand things, just as adults have to reach if they want to grow in mental stature. Life is composed of lights and shadows, and we would be untruthful, insincere and saccharine if we tried to pretend there were no shadows. Most things are good, and they are the strongest things, but there are evil things, too, and you could do a child no favor by trying to shield it from reality. The important thing is to teach a child that good can always triumph over evil, and that is what our pictures do.

I am a patient listener but opinionated to the point of stubborness when my mind is made up.

Nothing is ever born afraid . . . young things—human and animal—boy or black lamb—have had no experience with fear. They rely implicitly on parents—on someone bigger and stronger than themselves, to assure safety . . . on God as they grow older and threats to security multiply.

Fun and wonder are the important elements, in addition to quality in production and performance, which are most responsible for the success of Disney productions. Fun in the sense of cheerful reaction—the appeal to love of laughter. Wonder in that we appeal to the constant wonder in men's minds, which is stimulated by the imagination.

You may not realize it when it happens, but a kick in the teeth may be the best thing in the world for you.

I can never stand still. I must explore and experiment. I am never satisfied with my work. I resent the limitations of my own imagination.

The span of years has not much altered my fundamental ideas about mass amusement. Experience has merely perfected the style and the method and the technicques of presentation. My entertainment credo has not changed a whit. Strong combat and soft satire are in our story cores. Virtue triumphs over wickedness in our fables. Tyrannical bullies are routed or conquered by our good little people, human or animal. Basic morality is always deeply implicit in our screen legends. But they are never sappy or namby-pamby. And they never prate or preach. All are pitched towards the happy and satisfactory ending. There is no cynicism in me and there is none allowed in our work.

WHAT YOU SHOULD KNOW ABOUT

WISDOM MAGAZINE

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Albert Einstein	*G. R. Harrison*
My Credo	*A. Einstein*
Secret of Personal Power	*N. V. Peale*
A Changing World	*D. Sarnoff*
G. B. Shaw: Genius	*J. N. Brown*
Beauty In Poetry	*P. B. Shelley*
A Writer's Life	*S. Maugham*
U. N. And U. S.	*H. Ford, II*
Shakespeare	*M. Chute*
Four Strings	*H. R. Haweis*
Answer Lies In Questions	*R. Bunche*
Living With Your Heart	*M. Clark*
The Bible	*F. Oursler*
On Tolerance	*M. K. Ghandi*
Points For The Educated Man	*G. A. Coe*
Leonardo Da Vinci	*T. Craven*
Conquest Of Happiness	*B. Russell*
Abraham Lincoln	*C. Sandburg*
Art Of Living	*Lin Yutang*
The Gifted Child	*P. Witty*
Motion Picture Director	*L. C. Rosten*
From The Wisdom Of . . .	*W. Churchill*

VOL. 2 ALBERT SCHWEITZER

From The Wisdom Of . . .	*A. Schweitzer*
At Home In The World	*P. S. Buck*
Saint Joan Of Arc	*M. Twain*
Living In Expectancy	*L. C. Douglas*
George Washington	*T. Jefferson*
Civilization	*W. Durant*
On Being An Actor	*P. Muni*
What Is Living	*E. Chesser*
Rembrandt	*T. Craven*
Magic In Re-reading	*C. Fadiman*
Seven Stages Of Man	*W. Shakespeare*
Man's Pleasures	*G. J. Nathan*
The Pursuit Of Humor	*F. M. Colby*
Time To Think	*N. Cousins*
Aristotle	*H. Thomas*
Art Of Seeing Things	*J. Burroughs*
Unfinished Symphony	*B. Shore*
Romance Of Words	*Funk & Lewis*
Woodrow Wilson	*A. P. Dennis*
Appendicitis	*R. T. Morris*
Intelligence	*L. Witmer*
Mystery Of The Law	*M. Radin*

VOL. 3 BERNARD BARUCH

Bernard Baruch	*E. Roosevelt*
From The Wisdom Of . . .	*B. Baruch*
My Broken Doll	*H. Keller*
Man, Conqueror Of Time	*R. May*
Why We Marry	*A. Fromme*
The Franklin Legacy	*H. Hoover*
Simple Life In Greece	*H. W. Van Loon*
Little Giant Of Music	*D. Taylor*
We Must Become Men	*V. Van Gogh*
Happiness	*M. Maeterlinck*
You Must Relax	*E. Jacobson*
The Mind Of Napoleon	*J. C. Herold*
Look In Webster's	*H. R. Warfel*
John Dewey: Thinker	*I. Edman*
Portrait Of France	*P. E. Charvet*
Digging Up History	*L. Woolley*
Witchcraft	*W. O. Douglas*
Tomorrow's Explorers	*J. G. Leithauser*
Art Of Reading Aloud	*B. G. Henneke*
Thomas Jefferson	*F. L. Berkeley, Jr.*
Ryder: Master Painter	*T. Craven*
Motion Picture Producer	*L. C. Rosten*

VOL. 4 WINSTON CHURCHILL

Winston Churchill	*C. Eade*
The Self Emerges	*M. A. Ribble*
Novels Are Historical	*B. A. Williams*
Stolen: Thunder	*N. Corwin*
Knowledge And Wisdom	*R. M. MacIver*
God's Greatest Gift	*J. L. Liebman*
Mozart	*B. Shore*
We Cannot Help Praying	*N. V. Peale*
Parents Get A Chance	*E. Schour*
Nature's Disciple	*W. Condry*
Silence	*H. D. Thoreau*
Van Gogh	*T. Craven*
Women On The Frontier	*P. Horgan*
Mathematics	*W. W. Sawyer*
Parlez-Vous English	*A. Buchwald*
Men And Wings	*B. Stillson*
Is Baseball Greek	*J. Barzun*
Candles On The Cake	*H. C. Adamson*
Report On America	*C. Columbus*
Dictionary For Moderns	*H. Stebbins*
Invitation To Understanding	*F. Mayer*
Wit Of Wisdom	*Selected Authors*

VOL. 9 GEORGE BERNARD SHAW

G. B. Shaw	*L. Kronenberger*
Thoughts	*G. B. Shaw*
From The Wisdom Of . . .	*G. B. Shaw*
Mother Ganges	*R. M. Lewis*
Correct Thinking	*J. J. B. Morgan*
Birth of Automation	*R. Burlingame*
Pleasures Of Reading	*B. Rascoe*
Prophet Of Common Sense	*H. Thomas*
The Cultivated Man	*D. S. Miller*
What Is A Teacher	*S. Gould*
The Teaching Profession	*R. Tobin*
Italy	*H. Sutton*
Purpose Of Fiction	*C. Hamilton*
Fictional Characters	*A Portfolio*
Narratives	*Great Authors*
Men And Ideas	*Aristotle*
Invitation To Understanding	*F. Mayer*
Their Last Words	WISDOM *Selections*
Wit Of Wisdom	*Selected Authors*

VOL. 10 CECIL B. DE MILLE

Cecil B. DeMille	*A Tribute*
The Ten Commandments	*Scenes*
From The Wisdom Of . . .	*C. B. DeMille*
Moses: Liberator, Lawgiver	*H. George*
Sketches Of Moses	*Friberg & Jensen*
The Prophets	*F. Mayer*
Solomon	*H. Thomas*
What Is Religion	*C. S. Braden*
Prayer	*G. A. Buttrick*
Brahms: Musical Genius	*E. Hitschmann*
Artists In Crystal	*K. Kup*
Happy World	*Pictorial Essay*
The Twilight Years	*E. P. Hagman*
Men And Ideas	*B. Spinoza*
Reflections	*F. Fenelon*
Invitation To Understanding	*F. Mayer*
Their Last Words	WISDOM *Selections*
Wit Of Wisdom	*Selected Authors*

VOL. 11 HELEN KELLER

Helen Keller	*A Tribute*
From The Wisdom Of . . .	*H. Keller*
Political Parties	*Merriam & Bethea*
The City	*L. Mumford*
The City Is Art	*K. Kuh*
What Is Law	*L. Green*
Law Through The Ages	*Selected Authors*
Supreme Court	*R. K. Carr*
Enjoyment Of Life	*J. A. Magner*
Modern Woman	*A. Montagu*
Dufy: Poetic Painter	*J. Lassaigne*
Life 10 Years From Today	*L. Cherne*
Man Against Himself	*V. A. Langille*
The Battle For Faith	*L. Binstock*
Invitation To Understanding	*F. Mayer*
Ideas That Made History	*H. Stebbins*
Television	*L. Kronenberger*
Wit Of Wisdom	*Selected Authors*

VOL. 12 JESUS

Preface	*S. R. Harlow*
Modern Missionary	*Bliss & Schaff*
The Era Of Jesus	*J. Finegan*
Gospels: Story Of Jesus	*J. Erskine*
Life of Jesus	*C. Dickens*
Pictorial Summary	*Great Poets*
Wisdom Of Jesus	*Renan & Seale*
Jesus As Seen By . . .	*Master Painters*
Jesus In The Minds Of . . .	*Great Men*
His Spirit In Our Time	*C. E. Macartney*
Jesus In The New Age	*E. Goodenough*
Meaning Of Jesus Today	*A. Schweitzer*
The Beatitudes	*H. T. Kerr*
Meaning Of The Parables	*E. Seale*
Wedding Robe Parable	*E. Seale*
Christus	*H. W. Longfellow*
Eternal Jesus	*Serman & Prichard*

VOL. 17 JUNG, ADLER, FREUD

Sigmund Freud	*C. S. Hall*
Freud On Personality	*G. Murphy*
Adler's Approach	*J. Corrie*
Jung's Approach	*W. Wolfe*
Meaning Of Dreams	*S. Freud*
Psychology	*K. Dunlap*
Psychoanalysis	*K. A. Menninger*
Psychiatry	*K. A. Menninger*
Psychiatrist And Patient	*L. Paul*
Study Of Human Nature	*J. F. Dashiell*
Studies Of Genius	*L. M. Terman*
People Act That Way	*B. Katz*
The Thinking Process	*E. R. Hilgard*
Fear And Anxiety	*E. R. Hilgard*
The Neurotic Type	*K. A. Menninger*
Moody Personalities	*K. A. Menninger*
Worry And Tension	*L. F. Shaffer*
Emotional Control	*W. W. Cruze*
Personal Maturity	*A. Fromme*
Meaning Of Intelligence	*D. Wechsler*
Religion And Psychology	*J. L. Liebman*

VOL. 18 DWIGHT D. EISENHOWER

America	*Text & Pictorial*
A Message From	*The President*
From The Wisdom Of . . .	*D. Eisenhower*
American Heritage	*Selected Authors*
—The Land	*Selected Photographers*
—The East	*Photographic Essay*
—The South	*Photographic Essay*
—The Midwest	*Photographic Essay*
—The West	*Photographic Essay*
Of Space And Time	*Selected Authors*
—Transportation	*Photographic Essay*
—Distribution	*Photographic Essay*
Skyline U.S.A.	*Selected Authors*
—Cities, Towns, Villages	*Pictorial*
Vital Economy	*Selected Authors*
—The Worker And His Job	*Pictorial*
—Bounty Of The Earth	*Pictorial*
—Business And Manufacture	*Pictorial*
Arts And Sciences	*Pictorial*
Youth And Education	*Pictorial*
Living Freedoms	*Pictorial*

VOL. 19 ELEANOR ROOSEVELT

Eleanor Roosevelt	*F. Clayton*
—Humanitarian	*Part I*
—Citizen Of The World	*Part II*
Eleanor Roosevelt	*Picture Portfolio*
F. D. R. As Seen By	*E. Roosevelt*
From The Wisdom Of . . .	*E. Roosevelt*
The Conductor: King Of The Musical Realm	*K. Blaukopf*
Gentle Titan: The Story Of Charles Darwin	*D. C. Peattie*
Botticelli: Master Of Renaissance Beauty	*Art Study*
Modern Israel: New Land Of Many Yesterdays	*Huebener & Voss*
Wit Of Wisdom	*Selected Authors*

VOL. 20 WILL DURANT

Dr. Will Durant	*Tribute*
He Wrote One Book 30 Years	WISDOM
What Is Philosophy	*W. Durant*
Pleasures Of Philosophy	*W. Durant*
Our Oriental Heritage	*W. Durant*
The Life Of Greece	*W. Durant*
Caesar And Christ	*W. Durant*
The Age Of Faith	*W. Durant*
The Renaissance	*W. Durant*
The Reformation	*W. Durant*
The Age Of Reason	*W. Durant*
What Is Wisdom	*W. Durant*
From The Wisdom Of . . .	*W. Durant*
Cezanne	*Art Study*
Gift Of Imagination	*D. Seabury*
What Is Music	*R. V. Williams*
Concerts On Film	*F. Clayton*
Story Of Eyeglasses	*S. A. Fox*
Dishonesty	*T. B. Clark*
Emotional Depression	*J. J. B. Morgan*

VOL. 25 PABLO PICASSO

Pablo Picasso	*M. Raynal*
Picasso Paintings	*Portfolio*
Thoughts	*P. Picasso*
Wisdom Of The Ages	*Selected Authors*
Bahamas	*Travelogue*
Dvorak	*C. G. Hamilton*
Dvorak	*Pictorial Essay*
Analysis Of Genius	*B. Bliven*
Genius And Prolonged Illness	*E. Mayer*
What Is An Intellectual	*P. Kirk*
Answer Intelligently	*E. Walpole*
George Santayana	*R. Butler*
On Friendship	*G. Santayana*
Alexander The Great	*C. A. Robinson, Jr.*
Wit Of Wisdom	*Selected Authors*

VOL. 26 ERNEST HEMINGWAY

Ernest Hemingway	*J. Atkins*
From The Wisdom Of . . .	*E. Hemingway*
Age Of Achievement	*C. W. Hunnicutt*
Webster And Dictionaries	*E. Thompson*
How To Read A Dictionary	*M. J. Adler*
Uses Of A Dictionary	*Manly & Rickert*
Dictionary Adventures	*O. Shepard*
Dictionary Is Created	*Merriam-Webster*
Webster's New Dictionary	*Summary*
I live To Be One Hundred	*R. W. Burnett*
Birth Of Jazz Music	*G. Chase*
Virtues Of Humility	*R. L. Hudson*
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Learning To Concentrate	*A. L. Logan*
Your Reading Ability	*J. H. Wise*
The Sabbath	*A. J. Heschel*
Troubles Are Teachers	*C. E. Macartney*
Pleasures Of Laziness	*F. C. Kelly*
The Happy Life	*Seneca*

VOL. 27 ARNOLD J. TOYNBEE

Arnold Toynbee	*T. Lean*
A Study Of History	*A. J. Toynbee*
Civilization In Pictures	*Selection*
What I Have Tried To Do	*A. J. Toynbee*
From The Wisdom Of . . .	*A. J. Toynbee*
Imagination And The Writer	*M. Lewis*
Words And Emotions	*R. H. Thouless*
Evidences Of Education	*N. M. Butler*
New York	*J. Barzun*
Portrait And Painter	*M. Grosser*
Listening To Modern Music	*D. Taylor*
Beauty Born Of Storms	*A. Rutledge*
Will Power	*E. H. Sloane*
Overcoming Fear	*J. J. B. Morgan*
Why Good People Suffer	*R. L. Hudson*

VOL. 28 FELIX FRANKFURTER

Felix Frankfurter	*A. Lewis*
Bold Experiment	*F. Frankfurter*
Supreme Court Story	*J. Barbar*
American Law	*H. S. Commager*
Lawyers, Laymen, Law	*M. Radin*
Drama In High Court	*A. Lewis*
Ignorance Of Law	*B. Evans*
Oliver Wendell Holmes	*F. Frankfurter*
From The Wisdom Of . . .	*F. Frankfurter*
Music And Moods	*Howard & Lyons*
Faith And Mountains	*T. S. Kepler*
Language And Thought	*Manly & Rickert*
Hypnotism	*S. J. Van Pelt*
Rumors	*A Summary*
Propaganda	*A Summary*
Reporting	*Snyder & Morris*
Mind With Antennae	*K. I. Brown*
Liberal Education	*R. Livingstone*

INDEX TO CONTENTS OF VOLUMES

VOL. 5 ABRAHAM LINCOLN

Character Of Lincoln — *R. W. Emerson*
Life In The White House — *J. Hay*
Death Of Lincoln — *J. G. Nicolay*
From The Wisdom Of . . . — *A. Lincoln*
Antibiotic Age — *H. Vasil*
Splendor In Cathay — *H. Thomas*
Humor — *W. Disney*
The Dignity Of Man — *E. P. Cronan*
Paradise Marco Polo Missed — *J. B. Shor*
Doors — *C. Morley*
In Search Of Serenity — *R. V. C. Bodley*
Charles Dickens — *H. Pearson*
Dickens' Characters — *Selected Sketches*
Life On Mars — *R. S. Richardson*
Your Legal Adviser — *S. G. Kling*
Pursuit Of Wisdom — *D. Drake*
Kinds Of Workers — *J. J. B. Morgan*
Vision And Ideals — *J. Allen*
Search For Healing — *L. D. Weatherhead*
Shelley And Byron — *E. J. Trelawny*
Children — *R. W. Bacmeister*
Character In Stone — *L. M. Phillipps*

VOL. 6 JASCHA HEIFETZ

Jascha Heifetz — *Tribute*
The Violin — *H. W. Schwartz*
Experiment In Heredity — *A. Gregg*
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